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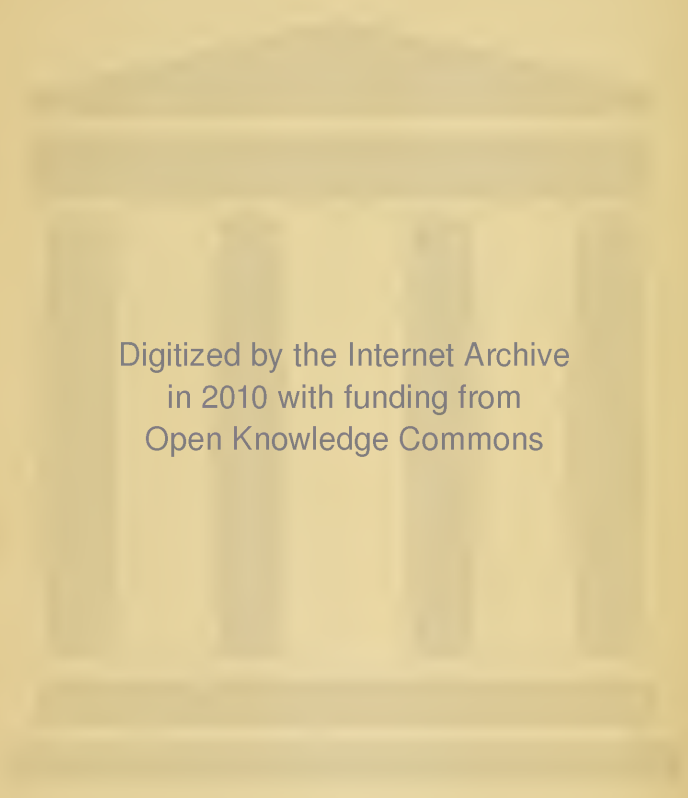
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June 1898.

In Memoriam.

JAMES ANDREW, M.D.

BY

W. S. CHURCH.

The death of James Andrew, on the 21st of April of the present year, although not unexpected by those who were acquainted with his state of health, yet came as a surprise to many generations of old Bartholomew men, who learned with deep regret that their valued friend and teacher had passed away so soon after resigning the active duties of Physician to the Hospital, and whilst many years of honourable retirement appeared to be still before him.

Dr. Andrew came of an old Yorkshire family, originally connected with Wakefield, but his immediate ancestors had settled at Birstwith, in the Valley of the Nidd, a few miles north-west of Harrogate. His grandfather, William Andrew, resided at Crow Trees, a small estate in the township of Birstwith, in the parish of Hampsthwaite, where the family had been resident since the commencement of the seventeenth century. William Andrew had a numerous family: one of the younger sons was James, the father of the subject of this memoir. In early life James Andrew was an assistant-master in a school at Beverley, near Pateley Bridge, and subsequently held a similar position in the National School at Bramley, near Leeds. Having decided to go into the Church, he was ordained, and not long afterwards, in January 1808, became stipendiary curate at Whitby under the Rev. T. Eglin.

The qualities which were characteristic in Dr. Andrew were also present in his father, who is described by one of the few who remember him as a quiet, unpretentious, earnest man, somewhat quaint in manner and appearance, and commonly known as "Parson Andrew." Parson Andrew was so highly

valued by those under his charge that, when ten years later the perpetual curacy of Whitby became vacant, a petition was sent by them to the patron, the Archbishop of York, praying that Andrew might be appointed perpetual curate, and he thus became the pastor of Whitby. The unselfishness which was a marked feature of his character was shown when the first epidemic of cholera visited Whitby, for Parson Andrew was not only untiring in his ministrations to the sufferers, but would not allow his curate to conduct any of the funerals of the victims for fear that he might in that way contract the disease.

In 1819, the year following his appointment as perpetual curate, he married Jane, the only surviving daughter of Mr. John Chapman, a member of an old-established Whitby family, who was familiarly known by the sobriquet of "Honest John." Miss Chapman was a lady of considerable intellectual power—bright, humorous, and witty, and greatly beloved by all who knew her. In her old age, her bright face and neat attire were very attractive to those of Andrew's friends who had the privilege of meeting her at his house; she was at that time debarred from taking part in general conversation from her extreme deafness, an infirmity which she transmitted to a less extent to her youngest son.

To Parson Andrew and his wife were born at Whitby three sons and a daughter who died unmarried in middle life. The three sons all distinguished themselves, and the similarity of their University careers was remarkable. William, the eldest, obtained a scholarship at Worcester College, and in due course, in 1842, a first-class in classics, subsequently becoming a Fellow of his College, and remaining there for many years as a resident tutor and lecturer on modern history. He was a man of retiring habits and somewhat uncouth appearance, but possessed vast stores of knowledge, and was remarkable for his linguistic attainments.

John Chapman, the second son, went up to University College, Oxford, having gained an exhibition known technically as a Bible-clerkship, and after obtaining a second-class both in classics and mathematics, became a Fellow of Lincoln. He left Oxford to take the headmastership of Nelson College, New Zealand, where he afterwards became Vice-Chancellor of the University of New Zealand and a member of the Legislature. We shall see that the third son, James, in no way fell behind his brothers in University distinction.

James Andrew was born at Whitby on the 8th of September 1829, and after receiving his early education at home, was placed under the care of the Rev. B. Richardson of Glaisdale, on the

river Esk, in the near neighbourhood of his home ; from thence he proceeded to the ancient and Royal Free Grammar School at Sedbergh, which was founded by Roger Lupton, Provost of Eton, in 1527, and further endowed by King Edward VI. in 1552. The school, when Andrew entered it, was under the headmastership of the Rev. John Harrison Evans, for whom Andrew entertained in after years an affectionate regard. Few particulars of Andrew's life at school are known ; one of his schoolfellows speaks of him as a shy, retiring boy, studious and remarkable for the excellence of his memory, a great pedestrian, and devoted to fly-fishing. Losing his father when fourteen years of age, the direction of his education fell on his eldest brother, William, and Andrew always spoke most gratefully of the assistance that his brother had given him in early life. Under William's auspices Andrew matriculated at Worcester College on the 9th June 1848 ; he stayed in Oxford to compete in the same month for a scholarship at Wadham, and was elected a Scholar of that College on June 30. Consequently, although he matriculated at Worcester, he was never in residence there as an undergraduate. Andrew used often to refer to the happiness of his College life ; by his talents and steady work he had secured it, and the same qualities rendered his life there successful. His narrow means necessitated a frugal life, and, together with his natural shyness, prevented him from entering freely into the social life of the College, but his sterling qualities won the respect of all who were acquainted with him, and the lasting affection of those who knew him best. His Oxford life was an uneventful one, and chiefly noticeable for his very great industry, his energy in boating, and his regardlessness of dress. Somewhat below middle height but strongly framed, Andrew proved himself a first-rate oarsman, and was singularly successful in his aquatic career, winning, among other prizes, the College sculls in 1851, the pair oars in 1852 and 1854, and rowing stroke of the College eight in 1853 and 1854, in which years the Wadham boat made no less than eight bumps ; whilst in the latter year he also rowed stroke of the eight which contested in a memorable, although unsuccessful, race with the First Trinity Boat Club for the Ladies' Challenge Plate at Henley. Andrew spent most of his leisure-time on the river, for when not rowing he was wont to amuse himself by sailing, his experience on the sea making him very dexterous in the management of sailing boats. Always an enthusiastic fisherman, he would of a summer evening amuse himself and keep his hand in by catching bleak on a small black gnat in the canal, and would sometimes catch a hundred or more of a night.

His steady industry bore good fruit, and he became an elegant and excellent classical scholar. In his examination he was thought not to have done himself full justice, and somewhat disappointed his friends by being placed in the second class when he went in for his degree in 1852. It is interesting to learn that he had for his College tutor the well-known Dr. Richard Congreve; and for a short time as a private coach, Dr. Mansel, afterwards Dean of St. Paul's.

After obtaining his degree, Andrew remained resident in Oxford, taking private pupils, and it was during this period that he rowed stroke of his College eight. In 1856 he was elected Probationer Fellow of his College and Actual Fellow the following year. Having made up his mind to follow medicine as his profession, the Warden, Dr. Symonds, nominated him in 1856 to the Wills Exhibition, and thus enabled him to leave Oxford, where at that time it was impossible to obtain any instruction in science or medicine, and enter on his medical studies elsewhere. Andrew decided on going to Edinburgh, and matriculated at the University as a first year's student in medicine, in October 1856. During his first winter session he attended Professor Goodsir's lectures on systematic human anatomy and also the course of chemical lectures, and during the following summer session Goodsir's lectures on comparative anatomy and Professor Balfour's course of botany. During both sessions he attended the courses of anatomical demonstrations, given then by Sir William Turner, and dissected under his superintendence. His diligence as a dissector was so marked that during these two sessions he dissected the entire body, having as his companion in work Mr. Thomas Annandale, now Professor of Clinical Surgery in the University of Edinburgh.

It had always been Andrew's intention to study the clinical portion of his professional work in London, and acting on the advice of Turner, he decided to enter at St. Bartholomew's Hospital rather than at St. George's, which, as was then customary with Oxford graduates, he had had thoughts of joining. He entered at our School on November 5 1857, and to be near his work, rented a couple of rooms over a shop in Smithfield, close to the gateway leading to St. Bartholomew's the Great. He was successively dresser to Sir William, then Mr. Lawrence; and afterwards clinical clerk to Sir George, then Dr. Burrows. In June 1860 he took his Bachelor's degree in Medicine at Oxford, and was admitted a member of the College of Physicians in the following year.

Such as Andrew was at the University, such he remained during life. Shy, modest, and retiring, he barely did himself

justice except when answering to what he felt a call of duty. His contemporaries at the Hospital hardly recognised at first the kind of man he was, but he rapidly gained in reputation among his fellow-students and teachers. The high estimation in which he was held led to his being appointed Demonstrator of Morbid Anatomy and Warden of the College in April 1861, before he had become a member of the College of Physicians. From this time, until his resignation of the office of Physician, his whole life may be said to have been bound up with the Hospital and its Medical School. He was now fairly launched on his medical life, and threw himself with great ardour into the work of Demonstrator of Morbid Anatomy. At that time neither pathology nor morbid histology formed any part of the student's course, and modern modes of investigation of the tissues were either unknown or only just commencing to be practised, and it is doubtful if before he became demonstrator he had seen any practical pathology or histology. During the years that he held the post he worked hard at pathology; portions of the organs of nearly every case examined in the dead-house were taken to his house, in which an attic was converted into a pathological workroom, and there night after night, and far into the night, he would work away, cutting sections and examining organs and morbid growths in their fresh state. The furniture of this primitive laboratory was somewhat scanty, a couple of rough tables, a few kitchen-chairs, some jugs for water, a few dishes and basins, together with a slop-pail, which Andrew could only be prevailed on to empty when it would hold no more, comprised the whole outfit, and those whom he kindly permitted to work with him and assisted in their work, must even now remember the appalling results which not infrequently followed the removal of the lid of that slop-pail.

His office as Demonstrator of Morbid Anatomy gave him no clinical work, and feeling the need for it, he applied for and obtained in 1862 the post of Physician to the Royal General Dispensary in Bartholomew Close, and in that capacity gained experience in abundance. In 1863 he was elected on to the staff of the City of London Hospital for Diseases of the Chest, Victoria Park, and remained connected with these two institutions as Physician and Consulting Physician until his death.

In 1863 he took his degree of Doctor of Medicine at Oxford, writing as his thesis an essay on "The relation between anasarca and the renal affection at the commencement of the so-called acute renal dropsy." This was perhaps his most important contribution to medical literature. It was the pro-

duct of much laborious work in the post-mortem room, the wards, and the above-described workroom, and played no unimportant part in demonstrating the view which is now very generally held, that the œdema of acute nephritis is not dependent on interference with the excretion of the watery portion of the urine by the kidney, but that "the relation in which the anasarca and renal affection stand to each other at the commencement is that of co-ordinate effects to a common cause."

Promotion came to him rapidly at St. Bartholomew's, and on February 24, 1864, he was elected without a contest Assistant-Physician to the Hospital, obtaining the vacancy caused by the resignation of Sir George Burrows and the appointment of Dr. Kirkes to the senior post. In the following year he was called on to deliver the introductory address at the commencement of the winter session, and chose for his subject, "On some of the causes which interfere with the recognition of medicine as one of the physical sciences." The address is a remarkable one, and in it Andrew ably vindicated the claims of medicine to be regarded as a science. He says, "We may fairly ask here to be judged by the same standard as is applied to our fellow-workers in the other physical sciences. If nothing can be called a science until the facts which it deals with have been fully explained, medicine, indeed, can lay no claim to that title; but our neighbours will fare no better than ourselves. Physiological reactions are not less certain than chemical ones; they are used even by chemists themselves for the same purposes and with equal confidence. What is called science in the laboratory is called empiricism at the bedside."

Andrew had at this time just retired from the Wardenship of the College, and had moved to No. 59 Russell Square, doubtless having in view his intended marriage; this was deferred until 1868, when, having been appointed Lecturer on Medicine conjointly with Dr. Black, he felt himself in a position to maintain a wife, and on October the 13th of that year was married to Isabella, a daughter of Mr. Henry Simpson of Whitby, to whom he was devotedly attached, and with whom he had been intimately acquainted since boyhood. At the commencement of the following year, January 27, 1869, Andrew was elected Physician to the Hospital, filling the vacancy caused by the death of Dr. Edwards.

We have now traced Andrew's life from childhood until the time when, in the prime of life, he became Physician to St. Bartholomew's Hospital, and from that time until his resignation

he most faithfully discharged the duties of his position. It is difficult for those unconnected with St. Bartholomew's Hospital to realise the influence he exerted there, and the feeling with which he was regarded alike by the governing body, his colleagues, and the students.

Andrew's natural shyness and love of retirement, together with, in later years, his increasing deafness, prevented his taking a prominent place in professional life; but at the College of Physicians his worth was recognised and he was held in the highest esteem by all the Fellows. Having been admitted a Fellow in 1866, he in due course filled some of the most honourable posts in the College, being successively an Examiner, Councillor, Lumleian Lecturer, Censor, and Harveian Orator. He chose as the subject of his Lumleian Lectures, "The ætiology of phthisis," then (1884) attracting very general attention. Whilst fully accepting the bacillus of Koch as the essential cause of phthisis, and agreeing with the words of his colleague, Dr. Klein, "No tubercle without bacillus, and no bacillus without tubercle," Andrew nevertheless dissented from the conclusion that phthisis should be classed among the contagious diseases, and sums up his lectures with the practical deduction—"that the prevention of phthisis, like that of ague, is to be attained by sanitary works, especially by improved ventilation and drainage, and not by isolation,"—a deduction which it would be well for many sanitary enthusiasts to bear in mind.

Six years later, in 1890, he was appointed Harveian Orator, and in his oration, after touching on the relationship of physiology to medicine, and expressing an opinion that "one of the best, if not the best," definitions of medicine is that which describes it as "applied physiology," he proceeded to investigate the relationship between the systemic and the pulmonary circulations in respect to blood-pressure, showing how important it was to have a better knowledge of this subject for the rational treatment of hæmoptysis. The treatment of this symptom had a little before this time been considered by him in a lecture which he gave, but did not publish, at the City of London Hospital for Diseases of the Chest. About the same time he also read the Cavendish Lecture before the West London Medico-Chirurgical Society on "The relations between disease and regulating nerve centres;" so that it is evident that the connection between nervous influence and the state of the circulation must have occupied his mind very fully at this time.

It is to be regretted that Andrew wrote so little, for all that he did write was excellent, always suggestive, fully thought

out, and clearly expressed. One who knew him well writes thus of him: "Andrew was in my judgment a man of much acuteness, and bent as far as possible on ascertaining the meaning of the facts which he studied. His mind was naturally rather critical than that of a man of action. He was a great reader and a careful observer, but from his critical attitude he did not give to the world all that was to have been expected of him from his experience and knowledge of his profession." At one time it was his intention to have written a book on the Theory and Practice of Medicine, but the claims of an increasing practice, and his own severe criticism of what he had written, together with the appearance of Dr. Bristowe's work, prevented his carrying out his intention. Besides the essays already mentioned, Andrew contributed some papers to the Hospital Reports, of which he was for some years one of the editors, and a few to the Clinical Society's, and one to the Medico-Chirurgical Society's Transactions. The most important of these are those in the Hospital Reports dealing with the mode of production and the interpretation of cardiac murmurs, a subject which greatly interested him throughout his whole life. The first and third of these are the most important; the first (vol. i. p. 13) deals with "the diagnosis of systolic endocardial murmurs whose point of greatest intensity is at or near the left apex of the heart;" it lays no claim to originality, but is a careful examination into the views of Drs. Austin Flint and Walshe. This paper certainly led to the fuller appreciation of the value, from a clinical point of view, of the intensification of the pulmonary second sound at the base of the heart, as well as drawing attention to the assistance in diagnosis which may be obtained from a careful auscultation of the cardiac sounds in the back. The true explanation of the causes of non-regurgitant systolic apex-murmurs is still obscure, and Andrew in later years was ready to admit the possibility of other causes than those he mentions in his paper. The third (vol. xiii. p. 1) is a valuable contribution to clinical medicine, clearly putting forth his views on the significance and relative value of the physical signs found in connection with presystolic murmurs in the diagnosis of mitral obstruction.

Three years after his marriage Andrew moved from Russell Square to No. 22 Harley Street, and his private practice soon became considerable; his kindness and attention secured the confidence and friendship of his patients, and his old pupils were always most anxious to get the benefit of his advice; but Andrew was not calculated to become a fashionable physician even had he wished it. Shy and somewhat awkward in manner, he never

appeared at his best with strangers, and his extreme aversion to anything like self-advertisement prevented his being as generally known to the public as his merits deserved.

Reference must now be made to the part Andrew took, when, eleven or twelve years ago, the University of Oxford determined to pass new statutes regulating its medical degrees, and decided to introduce the plan of Boards of Studies in the various Faculties. It was to Andrew that the Regius Professor of Medicine naturally turned to gather the views of those Oxford graduates in medicine who were engaged in teaching in the various metropolitan medical schools; to him also the Oxford medical graduates looked for advice as to the nature of the changes to be urged upon the University. Andrew took the deepest interest in the question, and became a member of the first Board of the Faculty of Medicine, and gave up much valuable time to attend its meetings. As might be expected, he was strongly opposed to any change which involved a lowering of the standard of literary knowledge necessary for the M.B. degree, and strenuously resisted any plan which rendered taking the Arts degree unnecessary for the graduate in medicine. This renewal of his connection with his old University led to his College, in 1887, electing him to an Honorary Fellowship, a compliment which gave him the greatest pleasure, and one which he valued very highly.

Andrew was now approaching his sixtieth year, and although his activity and his interest in his work remained undiminished, he looked considerably older than his years, and his increasing deafness began to seriously inconvenience him. Nevertheless his general health appeared excellent, until he fell an early victim to the influenza which visited us in the winter of 1890-91. At the end of November he was suddenly seized with a violent attack, accompanied by pneumonia and much mental disturbance. The acute symptoms subsided quickly, and he was able to be moved to Bournemouth in eight or ten days; but it took him long to recover, and he was not able to return to town and work until the following May. From this time onwards he was prone to bronchial attacks, and although for a time his recovery appeared complete, those who knew him best could not but notice that he was no longer the man he had been. This Andrew felt himself, and, coupled with the anxiety he ever had about his wife's health, determined him to leave London when the lease of his house in Harley Street expired, and not wait until he was superannuated at the Hospital. He therefore resigned his Physiciancy, and was appointed Consulting Physician on March 23, 1893.

His numerous friends and pupils were naturally desirous that some lasting memorial of one who had laboured so worthily and successfully for the advancement of their school should be preserved in the scenes of his labours. After some persuasion he consented to have his portrait painted, and at the same time expressed a wish to have a tricycle given him, on which he looked forward to enjoying himself in the country. A most characteristic and successful portrait was painted of him by the Hon. John Collier, and now fittingly hangs in the Great Hall by the side of the other worthies of our school. The presentation of his portrait took place on June 28, 1894, in the anatomical theatre, which was filled to overflowing by his friends, colleagues, and past and present students; nor were the nursing staff absent, so anxious were all to pay him the honour he so richly merited by thirty-two years' devoted service to the Hospital and its school.

A few months after leaving London Andrew settled himself at Bournemouth, naming his house Rahere, after the founder of our Hospital. The total change from the active life he had led in town to the almost complete seclusion in which he buried himself in the country, was by no means good for his health. He became over-anxious about Mrs. Andrew, restless and troubled with sleeplessness, and his own health suffered; but it was not until the autumn of 1895 that his friends were really anxious about him. In November of that year he became seriously ill, and although under the unremitting care of his friend and former House-Physician, Dr. Bedford Pierce, his condition for a time greatly improved, his bronchitic attacks became more frequent, and his death occurred on April 21, 1897, at Moorland House, near Tavistock, whither he had removed only a few months before his death. He was buried in the peaceful churchyard of the little village of Peter Tavy, in the neighbourhood of Tavistock, the rector, an old college friend, reading the funeral service over his remains.

The above is a brief record of the principal incidents in Andrew's life, but it fails entirely in portraying the man, his true character and personal qualities. Throughout life he remained the same; such as we find him described by his old schoolfellow, so those who only knew him in later life found him; somewhat reserved, modest, ill at ease with strangers, but abounding in kindness; his transparent sincerity had an attractive charm for those who knew him best; regardless of external appearance, he appeared to some wanting in the polish and conventionalities of modern life; soon after he was elected Assistant-Physician, two of his colleagues in the

school remonstrated with him on the badness of his hat, and were amused when Andrew, taking it off and looking at it, said, "I bought it new within a month, and brushed it last week; what more would you have?" It is but due to Mrs. Andrew to observe that after his marriage his outward appearance underwent a very considerable change for the better.

It was quite refreshing to see him starting for a day's holiday, fishing-rod in hand, clad in garments which made you wonder when and where they were made, with a wide-awake of an indescribable shape, or rather want of shape, on his head. On these occasions he was for the time a boy again, so thoroughly did he enjoy getting away from the cares of life for a day. He usually spent his annual holiday in Norway or Switzerland, and by preference where he could get some boating. One year he and his wife rowed down the Moselle from Treves to Coblenz, and another time down the Main from Wirtzburgh to Frankfort. On the rare occasions on which he could escape from town for a brief holiday at Easter, he used to devote it to his favourite sport of fly-fishing. The only other amusement in which he was at all proficient was skating, and during the memorable Crimean winter he and his brother John skated from Oxford to London. It was an adventurous journey, as John fell through the ice, and James, knowing that his brother had a life-belt on, kept on his way for fear of falling through himself. John had forgotten to blow out his life-belt and was in some danger, so James had to return and help him out.

His work at the Hospital was a labour of love, and, as he said himself when taking leave of his old friends and pupils, next to his home his happiest hours had been spent there. It was in the wards of the Hospital that you saw him at his best, for it was as a clinical teacher that he excelled; his lectures, although excellent, were somewhat dry, and perhaps a little over the heads of most of his hearers; nevertheless he always commanded a large and attentive audience. In the wards his kind and considerate attention to his patients was a pattern to all, for he was ever thinking of little things to ameliorate their condition and increase their comfort, and was extremely particular that they should not be unnecessarily examined by his pupils. Many generations of clinical clerks lovingly remember the somewhat stooping figure, the old ward coat stained with acid and adorned with a pin for testing sensation, the peculiar attitude, one foot propped against the ankle of the other, and the fingers of the left hand in the trouser-pocket, which is associated in their minds with their ward work in the Hospital. In his teaching he endeavoured to

raise the interest of his pupils in their cases, and in answer to questions was prone to make use of the Socratic method, and reply by asking another which gave food for reflection and thought. As a clinical teacher, Andrew at his best was second to none of the great physicians who had preceded him at his Hospital. Often, too, would he ask a good student to come and have a smoke and a talk over his work with him in Harley Street, and many must look gratefully back to those pleasant and instructive evenings.

Andrew not only spoke but thought kindly of all men. No man could be freer from envy or jealousy than he, and his own goodness made him unwilling to judge any man hardly. His generosity was unbounded. An old college friend says, "His means necessitated a frugal life, but I remember that when a new boat was required for the College eight, he gave so large a subscription that we were all astonished at it." In later life he was not only generous with his purse so far as his means allowed, but freely gave what was of much greater value, his skill, his convenience, and his time to all who sought his help, whether in professional or other matters. No old Bartholomew man, or in fact any one else, ever appealed to Andrew in vain; if he could in any way help, no trouble deterred him from giving his best advice and assistance. Shortly before his death he expressed a desire to his wife that his books should be presented to the Hospital Library, and this wish Mrs. Andrew has most generously carried out.

Many of those who have passed away from among us have attained to higher eminence in their profession and occupied a greater position in the eyes of the public than James Andrew, but few have surpassed him in the value of the services rendered to the Hospital and its school. As a physician and a clinical teacher he justly takes rank with Latham, Burrows, Baly, and Kirkes; and in his private life he will ever be remembered by his intimate friends as one of the kindest, most modest, and most generous of men.

SAINT BARTHOLOMEW'S HOSPITAL REPORTS.

THE TRIPOD OF LIFE.

BY

SAMUEL GEE, M.D.

Huxley says that "these three organs—the brain, the lungs, and the heart—have been fancifully termed the *tripod of life*."¹ There can be little doubt that he knew not who invented the similitude, because he has misrepresented it. He probably took it at second hand, or even at third or fourth hand. Most likely he found the phrase in Watson,² who writes that "the heart, lungs, and brain have been said, by a bold figure of speech, to constitute the tripod of life." Watson in turn probably copied the blunder from Laennec,³ who says, "Le cœur et le poumon forment, avec le cerveau, suivant l'ingénieuse expression de Bordeu, le trépied de la vie." The fact that Laennec, in quoting the expression, has misquoted it, proves that he did not take it directly from Bordeu. Laennec, who was the disciple of Bichat, obviously confounded a dim recollection of Bordeu's similitude with Bichat's teaching that "toute espèce de mort subite commence en effet par l'interruption de la circulation, de la respiration ou de l'action du cerveau."⁴

What Bordeu really meant by the tripod of life is found in his "Recherches sur les Maladies Chroniques" (première partie.

¹ Elementary Physiology, 9th edit., p. 19.

² Principles and Practice of Physic, 4th edit., vol. ii. p. 1.

³ Auscultation Médiante, deuxième édit., vol. i. p. 1.

⁴ Sur la Vie et la Mort, troisième, édit. p. 156.

§ xii.): “Le cerveau, le cœur et le ventricule sont donc le triumvirat, le trépied de la vie;” or, as he puts it in another form: “La tête, les régions épigastrique et précordiale, trois centres notables et le vrai trépied de la vie.” Not a word about the lungs. And now we see that Borden only reproduces the ancient doctrine of the three constitutions of a living body, namely, the animal, vital, and natural constitutions; a doctrine how ancient I do not know. Thus all that Borden did was to invent the picturesque phrase—the Tripod of Life.

ON
THE MEANING OF THE WORD DELIRIUM.

BY
SAMUEL GEE, M.D.

We may gain from etymology a clear insight into the meaning of the word delirium. The Latin word *lira* signifies a balk or ridge of earth raised by the plough: the verb *lirō* signifies, I plough; and ploughing is or ought to be straight and right. *De-lirō* signifies, I plough awry; and from *delirō* is derived the word delirium.

With respect to the actions of men, we set up a standard, rule, or notion (founded upon common sense or opinion) according to which a man may act and be deemed in his right mind. To deviate from this standard is to be delirious, to *wander* in the mind.

Delirium implies failure of the mental powers, but not of all these powers. Just as in falling asleep, one faculty slumbers after another, and not all at the same time, so delirium indicates partial failure of mind. Reason (which is "the power of judging aright, and of distinguishing truth from error"¹) slumbers, and the other faculties, being uncontrolled, run riot. (1.) Imagination tends to be especially active; delirium of this kind has a close resemblance to dreaming. The patient perceives phantoms or alucinations, and cannot distinguish them from true and trustworthy appearances.² These alucinations relate to any of the senses; to touch perhaps most seldom of them all: sights, sounds, smells, tastes, all may be delusive, and especially sights. The mere perception of phantoms does not constitute delirium: if the patient know them to be phantoms, apparitions, visions, and rate them at their proper value, he is not delirious. But if reason (the ruling or hegemonic power) be weakened, when phantoms appear, the patient

¹ Descartes, Discourse on Method, Part I.

² For the admirable distinction made by the Stoics between phantasie and phantasmata, see Diogenes Laertius, Zeno, § 36.

believes in them, and delirium follows. (2.) The passions also are unusually manifest, being unrestrained. The dictum of Hobbes, that "madness is nothing else but too much appearing passion,"¹ would be more accurate if thus expressed: that too much appearing passion is a sign of madness: *ira brevis furor*.

What coma is to sleep, delirium is to dreaming; for "delirium is a dream arising from disease."² In both dreaming and delirium, reason slumbers. A dreaming person can be roused to full and lasting wakefulness; but a delirious person can be roused but incompletely, and for a short time, or not at all. Just as the dreamer is only half asleep, so delirium is a state midway between consciousness and coma, that is to say, the reason (*primum dormiens*) is already comatose. Thus delirium often precedes, and sometimes follows coma.

Madness is the English word for delirium; but madness has come to mean lunacy. The distinction between lunacy and what is commonly called delirium is founded upon practical considerations. When delirium is habitual, so that the patient is always mad, or is liable to frequent outbreaks of madness, we call it lunacy, and subject the person to special laws and treatment.

Delirium when attended by fever constitutes phrenitis or brain fever. The Greek word *φρήν* (or rather its plural, *φρένες*) signifies *mentis sedes*, the seat of mind. It seems to be a natural instinct of mankind, in an early stage of knowledge, to deem the præcordia, that is to say, the parts where the heart can be felt to beat (and especially the pit of the stomach or epigastrium) to be *mentis sedes*. Hence the use of the word phrenic as relating to the diaphragm; and hence, in some of the Hippocratic writings, phrenitis is classed among diseases of the abdomen. The Hebrew phrase, "an understanding heart," and the old English phrase, "wood-heart" (= woodness or madness), testify to the same ancient physiology. The Hippocratic treatise "De Morbo Sacro" marks the progress to later doctrine that the brain is *mentis sedes*.

Some people possess an original tendency to delirium, which is often the same thing as an inherited tendency to insanity. For an instance well known to occur: a woman will suffer from mania at the birth of each child, several members of her family having become insane. But what is less well known is the fact that, in persons of this kind, not only serious diseases, but very slight ailments may be attended by delirium lasting for a few

¹ Leviathan, Part I. chap. viii.

² John Hunter, Works, vol. i. p. 333.

days.¹ Prolonged toothache, strong emotion,² the fatigue of a railway journey, are possible causes of temporary mania.

A disposition of much the same sort is that which consists in an extreme susceptibility to drugs which act chiefly upon the brain. Alcohol may make such persons not drunk, but raving mad. An injection of morphia may produce not sleep, but excitement and delirium. But no drug acts more powerfully than *cannabis indica*: e.g. an unmarried lady, thirty years old, after taking ten minims of the tincture, almost immediately complained of a feeling of fire in the head, and of other strange alarming sensations, she not knowing what drug it was she had taken. Narcotic drugs act thus more frequently in women than in men. It is best to give morphia cautiously to a woman until it is known how she will bear it, and not to give hemp at all.

“When sleep puts an end to delirium, it is a good sign.”³ Most true; but it is not always easy at first to say that what looks like sleep may not be supervening coma: and how great the prognostic difference; the one signifying recovery, and the other death.

That form of typhoid fever which is marked by incessant raving delirium is hard to be distinguished from meningitis or from phrenitis due to some other morbid poison. This is especially the case when the typhoid delirium sets in unusually early, during the first week of the disease, and before the eruption appears. Moreover, in some of these cases the eruption never appears; and it is not safe to affirm the presence of typhoid fever in the absence of the eruption. Nay, more; suppose that this raving and roaring delirium (*febris ululans*) be attended by constipation, a retracted belly, temporary rigidity of the neck, and watery discharge from the ear; suppose that spots be absent throughout the whole course of the disease, and

¹ See Trousseau, Clin. Méd., deuxième édit., vol. ii. p. 710.

² A girl, eleven years old, was quarrelling with another child and broke a window-pane. She was very much frightened by scolding and threats from the man who lived in the house. Her mother found her “out of her mind,” and brought her to the Hospital (April 19). On admission:—“She throws herself about, constantly moving arms, tries to catch imaginary objects in the air, often starts and looks fixedly in divers directions, sometimes calls out, and talks to herself. She cannot be made to understand or answer questions, and seems not to know her parents. She will not take food; passes urine into bed. Pupils very widely dilated. Temp. 97.8°; pulse 84; no physical signs of disease; urine natural.” April 20: She continued in much the same state during the greater part of the night; no sleep. This morning she is more sensible; says she has pain in her head, which began yesterday morning, but she does not remember anything since then. She is much quieter, but still throws herself about, and calls out now and then. She takes her food well. The optic discs are somewhat hazy, and the veins large and tortuous. April 21: Quite rational; optic discs clearer. April 22: Quite well; temperature natural throughout. No insanity, epilepsy, or chorea known in the family.

³ Hippocrates, Aphorisms, ii. 2.

that examination of the eyes be impossible through the eyelids being kept tightly closed. Yet all this happened to a patient of mine who died in the fourth week of illness, and whose intestines showed typhoid lesions of that period; the brain being healthy. Testing the blood by cultivations of typhoid bacilli would now be employed as an additional means of diagnosis, but a negative result would be probable early in the disease. Otitis interna is not uncommon in the course of typhoid fever; both ears are usually affected. By means of this otitis, typhoid fever may be actually complicated with meningitis, at least if optic neuritis followed by atrophy can be accepted as evidence of meningitis.

In rheumatic fever, delirium occurs under several distinct conditions:—

I. Temporary slight delirium is not uncommon, even in persons who have not drunk hard; and especially at night-time (*noctibus aliena loqui*). It may be that large doses of salicylic acid have something to do with it.

II. But delirium is sometimes the main symptom of the disease—delirium which is raving and apt to end in coma. The temperature in these cases may be high, but is not necessarily so: that is to say, the delirium cannot be attributed to the raised temperature. (1.) This delirium is sometimes of the same kind as that which occurs in typhoid fever, *i.e.*, not connected with any local disease; indeed, the arthritic symptoms are sometimes very slight.¹ Cerebral rheumatism this form of delirium has been called. Drunkards are prone to it. (2.) Delirium is sometimes associated with, and dependent upon, local inflammation, namely, pericarditis, pneumonia, or meningitis.

III. Delirium occurring after the cessation of rheumatic fever; a chronic lunacy, lasting for months, and of the same kind as sometimes follows typhoid and malarial fevers.

¹ A girl, thirteen years old, was admitted on April 2 for her third attack of rheumatism. She had been in bed for ten days. On March 29 and 30 she was delirious. April 2, temp. 102°. April 3, temp. 103.8°–104°; slight swelling of left knee, but of no other joint; aortic regurgitation; delirium marked; no eruption, abdomen not distended, no headache, optic discs natural, no otorrhœa, no signs about lungs, no vomiting, pulse regular, no salicyl compounds in urine. The diagnosis was difficult, because the signs of rheumatic fever were so slight. April 4, temp. 104°–103°; very delirious last night. April 5, the delirium ceased, but temperature did not come down for four weeks; no affection of joints all this time. But on April 14 pericardial friction was heard, and a large effusion followed, which had disappeared by the middle of May, when the girl was as convalescent as she could be.

A CASE OF
MEDIASTINAL TUMOUR WHICH PRESENTED
DIFFICULTIES IN DIAGNOSIS.

BY

SIR DYCE DUCKWORTH, M.D., LL.D.

H. W., æt. 48, a time-keeper, was admitted into Matthew Ward under my care on October 19, 1897, suffering from dyspnœa, cough, and pain in the chest. His temperature was 100.8°.

Previous history.—He had enjoyed good health till nine years ago, when he had an attack of rheumatic fever. Since that illness he had never felt quite well, and had been “weak at the heart.” He had also lost two stones in weight, and during the last four months he said he had lost seventeen pounds. Six weeks ago he began to cough and suffer pain in the left side of the chest, was unable to do his duty regularly, and had been compelled to take to bed for the last ten days before admission to the Hospital. The dyspnœa was gradually increasing.

The family history was not specially noteworthy. His father had suffered from rheumatism, and died paralysed at an advanced age.

The patient was a well-developed man, with a somewhat suffused, ruddy face, and an anxious, distressed aspect. There were some dilated venules on the face. The breathing was rapid and shallow, but ordinary recumbency was possible. The tongue was pallid, coated, and indented. The pupils were unequal, the left being larger than the right. Both reacted well.

Thorax.—Well developed and fairly well covered. The left side expanded feebly, and much less than the right. It was dull to percussion to the clavicle and to mid-sternum. Vocal fremitus was absent. The right front was everywhere resonant, and the breath-sounds clear and vesicular. Over the left front the respiratory murmur was very faintly audible, and tubular

in quality. The vocal resonance was increased and bronchophonic.

Heart.—The area of cardiac dulness was indistinguishable from the pulmonary dulness. An impulse was faintly perceptible below and just inside the left nipple-line. The cardiac dull area did not extend beyond the left border of the sternum. The sounds at the apex were clear and natural. At the base the first sound was hardly audible. The pulmonary second sound was accentuated, and the second sound was reduplicated over the right ventricle. The pulse was of moderate volume, 84, of rather low tension. Occasionally it was a little irregular, slowing down for a few beats. Pulses equal in both radial arteries.

Back.—Percussion was resonant all over the right back. The left back was dull all over, except at the root of the lung, where some resonance still remained. The air-entry was good over the right lung, possibly exaggerated. On the left side the respiration was very feeble, and tubular in quality in the upper part, while below the scapular spine the breathing sounds were annulled.

The abdomen was natural, and no viscera were palpable.

The legs were free from œdema, and natural in appearance.

The urine was of sp. gr. 1016, and free from albumin and sugar.

Above the right clavicle were several enlarged lympharia, freely movable.

Light diet was ordered, and six leeches were applied to the left side of the chest, with considerable relief.

October 20.—Pleuritic effusion being suspected, an exploring needle was passed into the left side, and a little thin, semi-opaque yellow fluid was withdrawn, which contained pus cells and blood.

October 23.—Paracentesis was practised, but only about a drachm of fluid was obtained. The cough was troublesome, in paroxysms, causing vascular fulness of the head and face. There was a good deal of mucous expectoration, but no hæmoptysis. On the evening of admission to the ward the temperature rose to 103.2°, and during the following week it remained pyrexial, varying from 99° to 102.6°, being higher sometimes at mid-day, but more frequently in the evening. Quinine and opium were ordered thrice daily, also a linctus. Some beef essence and four ounces of wine were added to the diet.

October 26.—A trocar was again inserted into the left side in front of former punctures. Some blood-clot only was found in the cannula, and no fluid was withdrawn.

October 29.—Another puncture was made in the mid-axillary line, and about two drachms of blood-stained fluid were obtained on aspirating. The cannula was again filled with clot.

The patient's general condition underwent no material change. The temperature varied daily from 99° to 103° . It reached 103.6° , the highest point, on the night of the 25th. The breathing continued hurried, the cough was lessened, and fairly good nights were passed.

November 1.—About 7 P.M. complaint was made of a choking sensation in the throat. This was followed immediately by a copious gush of hæmoptysis. Several pints of blood were ejected, and death promptly ensued.

During this patient's short stay in the Hospital several points of interest presented themselves for clinical study.

The previous history and occupation of the man threw no light upon the nature of his illness. It appeared certain that the left lung was inactive and largely encroached upon, and the physical signs indicated the presence of some considerable degree of pleural effusion, although there was no cardiac displacement to add further certainty to this suspicion. The repeated tapplings appeared to show that there was very little effusion. Reviewing the whole case, I formed the opinion that there was a new growth in the mediastinum, encroaching on the left lung and annulling its functions. The existence of enlarged glands in the neck appeared to confirm this opinion, and the occurrence of pyrexia was explicable on the idea that the growth was of a sarcomatous nature and making rapid progress. Such a growth might also implicate the upper dorsal or lower cervical left sympathetic ganglia, stimulating their vaso-dilator fibres and so causing dilatation of the left pupil. Such, then, was the provisional diagnosis. The untoward ending of the case falsified this, and indicated too plainly that the tumour was of an aneurysmal nature.

The direct *signs* of an aneurysm were thus all but absent. The *symptoms*, as the post-mortem record will presently show, were such as might readily be produced by such a tumour.

It is, of course, well recognised that aneurysms in certain situations may occur without the production of any classical signs, and the diagnosis in such cases is impossible.

The absence of history of all the usual provoking causes of aneurysm was a feature in this case. The patient had led a quiet life, had been temperate, and had not suffered from syphilis. There were no indications of pressure on any of the veins or large vessels in the thorax or neck. The radial pulses

were equal. The sounds of the heart were natural, and there was no accentuation of the aortic second sound. The accentuation of the pulmonary arterial second sound is probably explained by the condition of the left lung as ascertained subsequently. The enlargement of lympharia in the neck, though not unknown in connection with the presence of aneurysm of the thoracic aorta, is in my experience a rare event. There was no loss of voice nor modification of it, no "brassy" quality of cough, and no evidence, therefore, of any involvement of the left recurrent laryngeal nerve. There was no hæmoptysis in any degree, and no dysphagia. The thoracic pain was neither lancinating nor radiating. The radial and other arteries were not unduly hard or visible.

POST-MORTEM EXAMINATION.

(Inspection of the chest only permitted.)

The *œsophagus* was natural.

The *lymph glands* in the neck were found to contain no new growth, and to be simply enlarged from irritation.

Larynx and trachea.—Full of blood; otherwise natural.

Lungs and pleura.—The left pleura contained about a pint and a half of blood-stained fluid. The lung was somewhat compressed by this effusion. Right lung adherent at the base by old fibrous bands.

Heart.—Muscle pale. Left ventricle slightly hypertrophied. Foramen ovale, small valvular patency. Weight 13 oz.

Aorta and large arteries.—Very puckered and atheromatous. There was a saccular aneurysm protruding posteriorly from the arch of the aorta at the level of the bifurcation of the trachea. Its opening was the size of a half-crown piece. The aneurysm contained very little old clot. Part of the wall of it bulged into the left bronchus at its origin from the trachea. The tumour was on the distal side of the main vessels given off from the arch, and did not involve the left recurrent laryngeal nerve, which was on the proximal side of the tumour. The projection into the left bronchus was bulbar in form, about the size of half a hazel-nut, almost completely occluding the lumen of the tube. The mucous surface was intact, save where the aneurysm had burst through at a small ragged point. The right bronchus and finer tubes of the right lung were full of bright blood.

Lungs.—The left lung was somewhat compressed and solid throughout, greyish-red on section, and the bronchial tubes

were dilated generally, especially at the base, and contained pus. It sank in water. The cut surface was granular and had the aspect of grey hepatisation. The right lung was crepitant throughout, and the bronchial tubes of all sizes were filled with inspired blood.

No new growth was discovered. The lymph-gland at the bifurcation of the trachea was much swollen.

Mr. Pigg kindly made a microscopical examination of a portion of the left lung, and reported as follows:—

“The walls of the bronchi, especially the smaller ones, show a considerable increase of their fibrous tissue.

“The interalveolar septa show also considerable fibrosis (interstitial pneumonia), especially those near the termination of a bronchus.

“The air-vesicles are distended and filled with leucocytes, epithelioid cells, and red blood-corpuscles. Boiled sections show that there is some œdema.”

The post-mortem inspection completely explained both the signs and symptoms presented during life. We had to deal with a case of aortic aneurysm which gave but one of the commonly recognised signs at the bedside, viz., pupillary inequality, and it is hard to see how an exact diagnosis of the morbid state could have been made during life. The general obscurity of the signs, together with the enlargement of the lympharia, led one away from a suspicion that might fairly have been entertained as to a deeply-seated aneurysm. The left lung was rendered absolutely functionless, and the pent up bronchial secretions in it led to the interstitial and chronic inflammatory changes in its parenchyma, which condition again appears to have determined the occurrence of pleural effusion around it. Such mistakes in diagnosis will probably continue to be made, since the clinical problem in similar cases is confessedly difficult of solution; but they may perhaps sometimes be avoided by taking heed to the axiom laid down by Broadbent to the effect that “the *aneurysms of physical signs* commonly spring from the *ascending portion* of the aortic arch, while those of *symptoms* grow from the *transverse part* of that structure.” No case could better have illustrated the truth of that statement than that here recorded; and the following remarks of Walshe are also worthy of remembrance in this connection:—“The absence of symptoms and signs indicative of ordinary affections of the heart and lungs, in an individual suffering from persistent anomalous disturbances within the chest, even though he does not, or rather because he does not, exhibit any failure of general health, affords strong motive for suspecting aneurysm.”

I would refer the reader to several admirably reported cases by the late Dr. Pearson Irvine, which illustrate the peculiar condition of the lung, which is apt to supervene after prolonged occlusion of a bronchus by an aneurysm. They are to be found in the volumes of the Pathological Society's Transactions, xxviii. 63, xxix. 36, and xxx. 239. Another illustrative case is also recorded by Mr. Pick, as having occurred in Dr. Page's practice, in vol. xviii. of those Transactions, at p. 47.

It would appear that secretion in the bronchi, long pent up, may lead to a partly interstitial and partly destructive pneumonia, the former process somewhat akin to that occurring in the liver when the gall-ducts are either experimentally or by some morbid compression occluded. A condition of emphysema may at first supervene, followed by collapse in certain areas, to be succeeded lastly by croupous, chronic interstitial, and destructive changes. In the case just recorded I am disposed to believe that the greater part of the alteration in the left lung was due to interference with its functions for a period of six weeks or two months.

ON
THE GREEN STOOLS OF TYPHOID FEVER,
WITH SOME REMARKS ON GREEN STOOLS
IN GENERAL.

FROM THE PATHOLOGICAL DEPARTMENT,
ST. BARTHOLOMEW'S HOSPITAL.

BY

A. E. GARROD, M.D., A. A. KANTHACK, M.D., AND
J. H. DRYSDALE, M.B.

Introductory Remarks.

It is a matter of familiar knowledge that patients with typhoid fever occasionally pass stools of a bright green colour, but we have found no mention of this fact in any of the text-books of medicine which we have consulted. In a note upon this subject in the twenty-first volume of these Reports (1885, p. 110), Sir Dyce Duckworth, after mentioning that he had seen several cases of typhoid fever in which such stools were passed, adds: "It is difficult to account for cases of this character. Dr. Andrew, from his experience, is disposed to connect their occurrence with the existence of ulceration as well in the large as in the small intestine." In an earlier volume (xiii. 1877, p. 205), Dr. Samuel West recorded some cases of diarrhoea with continued fever, in two of which green stools were passed, and in which extensive ulceration of the large intestine alone was found post-mortem.

During the present year we have had opportunities of examining green stools from three patients with typhoid fever, two of whom were in St. Bartholomew's Hospital, and the third in Addenbrooke's Hospital, Cambridge. In all three cases the characters of the stools were identical. They had not the ordinary pea-soup consistence, but contained numerous particles, which by their shape and colour gave the appearance of chopped

parsley. These particles were suspended in a liquid which, when filtered, was turbid and almost colourless. In reaction the stools were acid, whereas the stools of patients suffering from typhoid fever are usually alkaline, and they were devoid of the ordinary offensive odour.

The passage of such stools is not necessarily associated with any exceptional severity of the disease, but the cases referred to were all severe, one proving fatal by perforation. In two cases the green stools appeared during relapses.

Although this particular variety of green stools seems to have attracted but little attention, green stools of other kinds, and especially those so often passed by children, have formed the subject of a considerable amount of investigation.

By the older authors the green colour was usually ascribed to the presence of biliverdin, but of recent years it has been asserted by Lesage and others, that although the green pigment is sometimes of this nature, it is frequently a pigment of bacterial origin. Seeing that these observations do not relate to typhoid fever, we may defer the consideration of them to our concluding remarks on green stools in general.

The Reaction and Presence of Bile Pigment in Typhoid Stools.

Typhoid stools are always described as having the consistence and colour of pea-soup, a very foul odour, and an alkaline reaction. If we add that they separate, on standing, into two layers, the usual description of the "typical typhoid stool" is complete.

The alkaline reaction is insisted upon, without reference to variations in the remaining characters of the stools, which, however, have often neither the consistence nor colour of pea-soup, and are not necessarily alkaline in reaction or foul smelling.

From an examination of a large number of typhoid stools before the addition of any disinfectant, we are in a position to state that not infrequently they exhibit a neutral, or even a faintly acid reaction. The loose yellow stools, when acid, do not show the usual powdery sediment, but, like the green stools, consist of the small discrete masses already described. Under these circumstances they are, as a rule, devoid of the characteristic foul smell. Stools of this character are frequently passed immediately before or after those which are green.

The presence of unaltered bile pigment in the loose stools of typhoid fever is a well-recognised fact,¹ * which is easily demon-

* The figures in the text refer to the "References" at the end.

strated by placing some of the solid particles on a porcelain dish, and touching them with a glass rod dipped in fuming nitric acid. The play of colours constituting Gmelin's reaction is then well seen. We have applied this test on many occasions, and have always obtained positive results when diarrhoea was present. The presence of bile pigment, which does not normally reach the lower parts of the alimentary canal unaltered, is indicative of catarrh both of the small and large intestine.

The passage of unaltered bile pigment is not by any means confined to the diarrhoea of typhoid fever, and Julius Rosenthal² has sought to prove that its occurrence can be accurately foretold in diarrhoea from any cause by noting the number of stools per diem, and he places the necessary minimum number at five or six. However, the movements of the bowel do not occur at regular intervals, and the second or third of two or three stools passed in the twenty-four hours may contain unaltered bile-pigment if they have followed each other in quick succession, or, on the other hand, the last of a considerable number may be devoid of bile if passed several hours after the preceding one.

The solid stools of typhoid fever may be acid, alkaline, or amphoteric in reaction, but, as far as our experience goes, do not contain unaltered bile pigment.

The Chemistry of Green Typhoid Stools.

Before proceeding to discuss the chemical nature of the pigment of the green typhoid stools, it will be well to sum up briefly what is known of the pigments of stools in general. That the ordinary tint of fæces is primarily derived from the bile which enters the intestine is shown by the familiar clinical fact, that when the common bile duct is obstructed in any way the fæces are decolorised. However, bile pigment as such is not found in the fæces in health. When a normal stool is extracted with water or with alcohol, a large amount of urobilin goes into solution, and usually a still larger amount of a colourless compound or chromogen, which becomes converted into urobilin on exposure to air or on the addition of an acid. The urobilin so obtained has properties similar to those of the urobilin of urine, showing the dark absorption band near the solar F line, and yielding a brilliant green fluorescence on the addition of zinc chloride and ammonia. It is almost certainly a derivative of the bile pigment, for a substance almost identical in its properties is obtained, as Maly³ long ago showed, by the action of sodium amalgam upon bilirubin, and more recently a similar product has been obtained by a number of observers⁴

by the action of intestinal micro-organisms upon bile or the bile pigment *in vitro*. After treatment with alcohol or water the faecal material still retains a brown colour, and it is not improbable that other less known or unknown derivatives of bilirubin also have a share in its coloration.

The alcoholic extracts usually show the bands of chlorophyll with great distinctness, and other accidental pigments derived from foods or drugs may also be present.

In cases of diarrhoea from any cause, the motions not infrequently contain unaltered bile pigment, which has apparently escaped alteration, owing to the rapidity of its passage along the alimentary canal.

Very different is the course of events when the solid portion of a green typhoid stool is treated with neutral alcohol. The alcohol remains colourless or acquires a pale yellow tint, and even on standing, or on the addition of an acid, no urobilin band is seen. Indeed, we have never in any of the green typhoid stools which we have examined been able to detect any trace of urobilin or its chromogen. Hence we must suppose that in the condition under consideration the normal conversion process in the intestine is completely in abeyance,

If now the solid green material be treated with alcohol to which a small amount of pure sulphuric acid has been added, its pigment is readily extracted and a dark bluish-green solution is obtained, which placed before the spectroscope shows no absorption bands, but only a general absorption of the blue end of the spectrum.

When this green solution is neutralised with ammonia and evaporated to dryness on the water-bath, the solid green residue which is left is found to be readily soluble in a dilute solution of sodium hydrate with a yellowish-green instead of a blue-green colour. With nitric acid the alkaline solution exhibits in a beautiful manner the tints of Gmelin's reaction from the green stage onwards, which shows that we are dealing with a bile pigment, presumably biliverdin. Further proof is afforded by the fact that on acidifying the green watery solution the pigment is precipitated, and when collected upon a filter is readily soluble in neutral alcohol, the solution having the rich green tint of biliverdin.

Every green typhoid stool which we have examined, both in the present and in previous years, has behaved in the above manner, and we do not hesitate to assert that such stools always owe their colour to biliverdin.

Seeing, however, that biliverdin is readily soluble in neutral alcohol, whereas the green stools only give up their pigment

on the addition of an acid, we must suppose that in them the biliverdin exists in combination, probably as biliverdin-calcium, and is set free from the combination by the sulphuric acid employed.

In some instances the stools have suddenly resumed their ordinary pea-soup consistence and alkaline reaction, and there has been a simultaneous reappearance of urobilin in large amounts; but in other instances the change has been a more gradual one, and was indicated at its commencement by the presence of small but gradually increasing quantities of urobilin.

Among cases of typhoid fever in which there is diarrhoea we have met with some in which the motions had for a time all the characters of the green stools, save for the absence of the green colour. The pea-soup consistence was replaced by the granular appearance, their reaction was acid instead of alkaline, the offensive odour was almost completely wanting, and they were entirely devoid of urobilin. In some instances such stools assumed a bright green colour after standing in contact with carbolic acid.

Whilst we must suppose that in cases with green stools the natural conversion process in the intestine is in abeyance, it is by no means certain that the presence of abundance of biliverdin in them implies an actual oxidation process.

It is as yet by no means certain whether, under normal conditions, the bile pigment enters the intestine as bilirubin or as biliverdin.

It is true that in gall-stones bilirubin-calcium is the chief pigmentary constituent, and post-mortem the bile in the gall-bladder of human beings has usually a golden-brown colour; but, on the other hand, in cases of biliary fistula, the bile escaping or drawn off is usually a rich green tint; but that this is not necessarily so is shown by a recent case recorded by Pfaff and Balch.⁵

The solid residual mass formed by the discrete particles of one of the "chopped parsley" stools was, after extraction of the biliverdin, submitted to a chemical examination by Mr. Wood Smith, who has kindly furnished us with the following report of his conclusions as to its nature:—

"The material was first treated with warm alcoholic potash, and then washed successively, on a filter pump, with alcohol, ether, alcohol again, and finally with distilled water.

"Small quantities of the mass left on the filter dissolved almost entirely both in dilute hydrochloric acid (5 per cent.) and dilute caustic soda (5 per cent.), giving in each case a clear solution which did not coagulate on boiling. On careful

neutralisation a precipitate was thrown down from both the alkaline and acid solutions. No point of difference could be detected between this material and a control mass of milk casein used in a parallel set of experiments."

The Urine during the Green Stool Period.

Examinations of the urine during the green stool period yielded results which are not without interest. There are good grounds for believing that much, at any rate, of the urobilin of urine is derived from the intestine, and in cases of complete biliary obstruction the simultaneous absence of this pigment from the stools and urine has been noted. Moreover, Friedrich Müller⁶ has found that when pig's bile was introduced into the stomach under such conditions, urobilin reappeared both in the fæces and urine. The appearance of the urobilin band in the urine of typhoid patients is very inconstant, but it is often seen with great intensity, especially during the convalescent stage. In our cases the passage of green stools was attended by a complete absence of the urobilin band from the urine, and when special processes of extraction were employed, mere traces of the chromogen were found; and when the condition had persisted for several days, even such traces were absent.

In one instance, after the administration of perchloride of mercury, the urobilin band reappeared with great intensity, and the stools of the same day were found to have suddenly resumed the ordinary characters of typhoid stools and to be rich in urobilin.

It is further interesting to note that the urine passed during the green stool period had the ordinary colour, urochrome (the normal yellow pigment) being present in undiminished amount, whilst uroerythrin (the pigment of pink urates) and traces of hæmatoporphyrin were also present.

Thus it would appear that of the four true urinary pigments which may be present in the urine of healthy individuals, three are quite independent of the conversion processes in the alimentary tract, and are presumably not of intestinal origin.

As regards urobilin, however, these observations appear to lend strong support to the theory of its intestinal origin, although observations of other kinds⁷ show that the possibility that some at least of the urobilin of urine has other origins cannot as yet be excluded.

Bacteriology of Green Typhoid Stools.

In addition to the chemical examination above described, cultures were made from some of the green stools, with the view, if possible, of separating some organism capable of producing a green pigment outside the animal body.

Cultivations were made from the green stools of the three cases of typhoid fever. In all cases the predominating organism was *Bacterium coli* or some member of an allied group.

Of the other organisms present in appreciable numbers, *Proteus vulgaris* was obtained in two of the cases, and a streptococcus in the third, all of which are commonly found in typhoid stools.

No other organisms were separated from any of the three cases.

The cultures were aërobic with one exception, but there the result was practically the same; that is to say, almost pure cultures of *Bacterium coli* were obtained.

In no instance was any organism found capable of producing a green pigment in artificial media.

The results of cultures made from green stools, in cases other than typhoid fever, also failed to discover any organism capable of forming a green pigment. These results we will refer to again in the section on green stools in general.

Now our object being to demonstrate or exclude the presence of chromogenic organisms, no selective methods such as Elsner's or Capaldi's were employed.

Relation of Green Stools to Ulceration and Catarrh of Large Intestine.

Observations by Adolf Schmidt,⁸ Vaughan Harley,⁹ and others, point to the conclusion that fæcal urobilin is for the most part formed in the large intestine and lower part of the ileum, and one is therefore tempted to associate the suspension of the conversion action and the passage of unchanged bile pigment with unusually rapid passage of the intestinal contents along this portion of the bowel. This suggests a reason for the association by Dr. Andrew of the green stools with extensive ulceration of the colon; and although in the fatal case which we observed the colon showed hardly any ulceration, there were strong indications of an extensive catarrh of its lining membrane.

The patient was a woman, aged 24 years, who was admitted into Mary Ward, under Dr. Hensley (to whom we are indebted

for permission to refer to the case), on March 13, 1897. The outset of the disease was dated back to March 8th. She presented the ordinary signs and symptoms of typhoid fever. On March 23rd there was a slight hæmorrhage, and a rather more severe one on the 25th. The primary attack was a severe one, the temperature ranged high, and there was tendon subsultus, and at one time the abdomen was very tympanitic. A relapse commenced on April 26th, in the early stages of which vomiting was a prominent symptom. "Chopped parsley" stools were first noted on May 3rd. On May 10th slight jaundice was observed. On May 14th she became suddenly much worse, complained of abdominal pain, became collapsed and died.

At the post-mortem examination, which was made by one of us, some excess of fluid was found in the peritoneal cavity, but there was no free gas nor any indication of general peritonitis.

In the intestines two sets of ulcers could be distinguished. Those of the primary attack, which were partially healed, extended to a distance of 5 feet above the ileo-cæcal valve. The more recent ulcers did not extend so high; they were few in number, deep, and had in almost every instance become adherent to the neighbouring structures. Several of those in the lower part of the ileum were adherent in front to the bladder and pelvic wall. Two feet above the ileo-cæcal valve there were two deep ulcers in close proximity. One or both of these had apparently perforated, forming a localised abscess between the intestine and the overlying omentum. The abscess cavity, which was as large as a Tangerine orange, contained yellowish pus, but no fæcal matter.

The large intestine showed only a few small ulcers and hæmorrhagic spots, marking the situations of solitary follicles. The colon was practically empty, and its inner surface was covered with a layer of mucus.

There were no ulcers in the vermiform appendix. The mesenteric glands were large and deeply injected.

The liver showed well-marked fatty degeneration. The walls of the common and hepatic ducts were bile-stained, but their lumen was partially obstructed by plugs of mucus.

Remarks on Green Stools in General.

Passing from the consideration of green stools in typhoid fever to that of green stools in general, it is necessary to refer briefly to some recent investigations on the subject. With certain exceptions these relate to individual cases, from which it is not in any way sought to draw general conclusions.

Thus Salus,¹⁰ in a case of fæcal fistula following ovariectomy, found that the contents of the bowel, although yellow on first passing from the fistulous opening, turned green on exposure to the air. From this material he was able to separate a bacillus having the cultural characters of the *Bacillus pyocyaneus*, the pigment of which gave the characteristic reactions of pyocyanin. He was able to exclude the presence of biliverdin from the stool, but he does not appear to have extracted pyocyanin directly from the fæcal material.

Kossel,¹¹ in a child suffering from diarrhœa and weakness, found the *Bacillus pyocyaneus* in the stools, to the almost complete exclusion of the ordinary bacteria of the intestine. After death the same organism was found in pure culture in the ear, nose, larynx, and trachea, and abundantly in the stomach and intestine. The stools passed during life became dark green on exposure to the air. He does not appear to have excluded the presence of biliverdin, or to have extracted pyocyanin directly from the stools. He regards his case as an altogether exceptional one.

In neither case is any mention made of the reaction of the stools, though an acid reaction would suffice at once to exclude pyocyanin, which is coloured pink in acid solutions.

Lesage¹² claims to have isolated the specific organism of the green diarrhœa of children, and to have reproduced the disease in young animals by inoculation with cultures both intravenously and into the alimentary canal.

He excludes, however, the green stools of new-born infants up to the end of the first month, classing them as "plainly bilious" and as wanting the specific bacillus.

The conclusions of Lesage seem to be open to several objections. The organism which he separated is, according to Baumgarten, the *Bacillus fluorescens non-liquefaciens*, a common saprophyte, and the success which he obtained has not fallen to the lot of others. Moreover, he admits the presence of bile in these stools, though in small quantities.

He states that the pigment which he separated both from the stools and from broth-cultures of his organism is insoluble in alcohol, chloroform, and ether. It is soluble in water and ammonium sulphate, and is decolorised by acids. The stools after treatment become colourless.

As already mentioned, Salus, who excluded the presence of biliverdin, does not appear from his paper to have extracted the pyocyanin from the stools in his case, from the nature of which, moreover, infection from the external opening cannot be excluded. Klein and F. W. Andrewes, who separated a

B. pyocyaneus from the stools of patients in an epidemic of diarrhœa at Greenwich, did not observe that the stools were green.

We see, then, that absolute proof that the green coloration of stools is ever due to the formation of any bacterial pigment is very scanty. In the cases of Salus and Kossel the evidence is incomplete; and if we accept the conclusion of Lesage, so far as his own cases are concerned, there is ample evidence that they cannot be maintained for the majority.

In a number of specimens of green stools of children of different ages which we have examined, biliverdin has been present in every case, and after its extraction the residue has been practically colourless.

Further bacterioscopic examination has, where it has been tried, in every case failed to demonstrate any organism forming a green pigment.

In all the cases (four) *Bacterium coli* or some organism of an allied group has been present in overwhelmingly large numbers.

The patients were in all cases beyond the age which Lesage assigns as the limit for bilious stools. In some instances the stools were solid.

These results are practically identical with those of Booker,¹³ who in an extended research on infantile diarrhœa failed in every instance to find any chromogenic bacterium. In thirty-nine green or greenish stools, he found in thirty-seven the *Bacillus coli communis*; in twenty-three the *Bacillus lactis aërogenes* (?*B. coli*). One or other of these organisms largely predominated. Some form of proteus was present in twelve cases, and in twelve also streptococci were present. In only eleven cases was any other organism whatever found, and then only in small numbers.

It is obvious that these observations, so far as they go, lend no support to the views of Lesage as to the specificity of his organism.

The presence of unchanged bile pigment in the stools shows clearly that the normal conversion of the pigment has not taken place. Whether this is entirely due to hastened peristalsis, or whether bacterial action has not some part, direct or indirect, in it, is undetermined.

We have made a series of experiments in order, if possible, to settle this question. Organisms of intestinal origin, some of them from the cases related, have been grown in media to which bile or its pigments have been added.

The results obtained have been, however, up to the present, neither constant nor convincing in either direction. Perhaps further experiments may enable us to come to some conclusions on this point.

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ON THE
BACTERIOLOGY OF ACUTE BRONCHO-
PNEUMONIA.

FROM THE PUBLIC HEALTH LABORATORY,
ST. BARTHOLOMEW'S HOSPITAL.

BY

P. HORTON-SMITH, M.D.

Before commencing this paper, it is my pleasant duty to record my great indebtedness to Professor Kanthack. It was at his suggestion that I undertook the work, and I thank him not only for this, but also for having helped me during its progress with his advice and experience. To Dr. Klein also I am grateful for his kind permission to work in his laboratory.

At the present day the controversy which long raged as to the etiology of acute lobar pneumonia has been silenced. It has been conclusively proved that the pneumococcus, if properly sought for, can be found in almost every case of the disease, and hence must be regarded as its essential cause.

The question is different, however, as regards the etiology of lobular or broncho-pneumonia. But few observations have been published on this subject in England, and those made abroad are scattered throughout the literature, and have never been collected and carefully analysed. The result is, that in this country at the present day, beyond a somewhat vague, and, as I hope to show, erroneous idea that most broncho-pneumonias are caused by the streptococcus, in contradistinction to lobar pneumonias, which are caused by the pneumococcus, but little is known about the matter.

I propose, therefore, in this paper to record a series of observations made on cases of broncho-pneumonia obtained

from the Post-mortem Room of this Hospital, and then, comparing my results with those of other observers, to attempt to give an answer to the following questions:—

1. What micro-organisms are responsible for cases of simple "primary" broncho-pneumonia (*i.e.* those following directly on acute capillary bronchitis and unconnected with any of the specific fevers)?

2. With regard to secondary broncho-pneumonias occurring during the specific fevers, is the view commonly held correct, that they are in all cases "heterologous" infections, that is to say, true complications, caused, not by the micro-organisms which are responsible for the diphtheria or measles, as the case may be, but by a secondary infection of other microbes, notably the streptococcus?

It will be simplest to begin by giving the result of my own observations, but first a few words must be said as to the method of procedure adopted.

Technique.

The lungs to be examined were taken direct from the Post-mortem to the Laboratory. Here an incision was made into a typically broncho-pneumonic patch. The portion of inflamed lung on one side was cut out and put into Müller's fluid for later microscopical examination, while that on the other side was further dealt with as follows:—Its surface was first sterilised with a red-hot glass rod, and a section was then made into it with a sterilised knife. Next—

(1.) A small loopful of the exudation from the centre was inoculated over three agar tubes and incubated at 38° C.

(2.) Some of the exudation also was transferred by means of a sterilised glass tube into a little sterile broth, enough being transferred to make the broth quite turbid, and of this 1 c.c. was injected subcutaneously into a mouse.

(3.) In many cases also some of the exudation was dried on a cover-glass and stained with methyl blue. In this way a very rough idea of the nature of the microbes present may be obtained.

At the end of twenty-four and again of forty-eight hours' incubation, the agar tubes which had been inoculated were examined, and subcultures in gelatine, broth, and, if necessary, other media also, were made of the various colonies which had appeared.

The mouse also which had been inoculated was examined daily until a month had elapsed. At the end of this time, if

it was still alive, it was considered absolute proof that no virulent pneumococci had been present in the material injected (and non-virulent pneumococci, such as those described by *Kruse* and *Pansini*,¹³* may be neglected, for they would be simply saprophytes, and therefore in this case unimportant). If the animal died, its peritoneal cavity, spleen, or blood were examined in the manner described below for pneumococci or other micro-organisms.

Tests Relied upon for Distinguishing the Various Micro-organisms.

With regard to the differential diagnosis between the various microbes, it may be mentioned that the following points were always determined in each case before deciding to which group a given microbe belonged.

(1.) *Staphylococcus pyogenes aureus, albus, and citreus.*—The microbes were found to be micrococci, not in chains, which, stained by Gram's method, grew on agar with the characteristic colour, liquefied gelatin more or less rapidly, and made broth turbid.

(2.) *Streptococcus pyogenes.*—The microbes were proved to be streptococci, growing in long chains, especially when taken from the condensation water at the bottom of the agar tubes. They stained by Gram's method.

They grew on gelatin fairly rapidly, the colonies being just visible in twenty-four to thirty-six hours. No liquefaction occurred. The growth on agar showed minute semi-opaque colonies. Broth-cultures remained clear, the growth clinging to the side of the tube and forming a sediment at the bottom. If injected into a mouse, the animal often died, and in this case the cocci found in the tissues did *not possess a capsule*.

(3.) *Pneumococcus.*—The microbes grew on agar, forming small flat colonies more or less transparent; the condensation water showed diplococci and short chains, which stained by Gram's method. On gelatin, as a rule, no growth appeared at all, but occasionally after four to five days minute colonies began to appear. Broth was rendered somewhat turbid.

In this case, however, these culture tests were always controlled by the inoculation test; for, in spite of what some writers say to the contrary, if reliance is placed *solely* on culture tests, it is sometimes very difficult to distinguish between the pneumococcus and the streptococcus. Hence it was considered essential that the mouse inoculated with the material believed

* The figures in the text refer to the "References" at the end.

to contain the pneumococcus should die, and show in its tissues the *Diplococcus lanceolatus* surrounded by its typical capsule. The presence of this capsule is quite distinctive, and is easily shown by staining the film of blood, peritoneal exudation, or spleen juice with methyl blue, washing and mounting in water. In this way, as *Kanthack*¹⁰ has shown, the capsule is brought out with ease and certainty.

A microbe only which answered all these tests was considered to be without doubt the pneumococcus.

The Tubercle Bacillus.—This was proved to be present in the cases of tuberculous broncho-pneumonia by staining the sections in the usual well-known manner.

Friedländer's Bacillus—*Bacillus Pneumoniæ*.—Though known so well by name, the characters of this bacillus, and especially its biological characters, are not so clearly defined as might be expected. Indeed, it is possible that more than one microbe may be included under the one name.

The following facts, however, are agreed upon. It is a non-motile bacillus, non-Gram-staining, and, when growing in the body, is surrounded by a capsule. It forms round porcelain-like colonies on gelatin, and in a slab culture the well-known "nail." It grows luxuriantly on potato, often forming gas bubbles in the culture. Also, if *Max Wilde*¹⁶ and *Etienne*⁷ be right, it does not coagulate milk, does not form indol, and never produces ammoniacal fermentation when grown in urine.

It may be stated at once, that in my observations no bacillus answering these requirements was found, though other observers have obtained bacilli in cases of broncho-pneumonia which they have described as Friedländer's.

Microscopical Examination.—In conclusion, it may be said that in all cases a microscopical examination of the tissue immediately adjoining that portion examined bacteriologically was made to control the naked-eye diagnosis of broncho-pneumonia.

The sections, in addition to being stained in the ordinary manner, were also always stained by Weigert's fibrin method to prove the presence or absence of this material.

Such, then, being my method of procedure, I may now proceed to give the results of my observations.

OBSERVATIONS.

SIMPLE "PRIMARY" BRONCHO-PNEUMONIA.

OBSERVATION I.—*Acute Bronchitis—Broncho-Pneumonia.*

Edward Cannon, 5 weeks, was taken ill with bronchitis five days before coming to the Hospital. He rapidly grew worse after admission, and died three days later, on the eighth day of his illness.

Post-mortem Report.—The autopsy showed bronchitis, with scattered patches of broncho-pneumonia and collapse. The other organs were all natural.

Microscopical Examination confirmed the naked-eye diagnosis. No fibrin could be seen in any of the inflamed alveoli, and none could be brought out by Weigert's method.

Bacteriological Report.—(a.) The cultures showed many colonies of the pneumococcus. The mouse also died on the fifth day after inoculation, the peritoneal fluid being crowded with typical lanceolate diplococci and surrounded by a superb capsule.

(b.) There were also present on the agar tubes a considerable number of colonies of an undescribed staphylococcus. Its cultural features, however, differed entirely from those of the pyogenic staphylococci. It was non-pathogenic to mice, and was without doubt a saprophyte, and may therefore be disregarded.

OBSERVATION II.—*Acute Bronchitis and Broncho-Pneumonia.*

Jessie Rosina Alford, 10 weeks. The child was admitted moribund into the Hospital suffering from bronchitis, and died in a few hours.

Post-mortem Report.—The lungs showed bronchitis, collapse of the lung, and scattered patches of broncho-pneumonia. All other organs were natural.

Microscopical Examination.—The typical lesions of bronchitis and broncho-pneumonia were visible. The inflamed alveoli contained no fibrin.

Bacteriological Report.—The agar tubes showed a pure culture of the pneumococcus. The colonies were numerous. The mouse which had been inoculated with the exudation died on the sixth day after the injection, of general pneumococcic infection.

OBSERVATION III.—*Acute Bronchitis—Broncho-Pneumonia—Suppurative Meningitis.*

Paget Drake, 5 months. Patient's illness began thirteen days before admission, with cough and shortness of breath. Patient later became rather cyanosed, and was admitted to the Hospital, having then the physical signs of broncho-pneumonia. Death occurred nine days later, being preceded towards the end by symptoms of meningitis. The signs in the lung remained unchanged until the end.

Post-mortem Report.—General meningitis was present over the convexity as well as over the base of the brain. The left middle ear was full of pus. The lungs showed disseminated broncho-pneumonia all over, while in the right lower lobe the patches had coalesced, forming a condition of "pseudo-lobar" pneumonia. The other organs were natural.

Microscopical Examination.—This confirmed the naked-eye appearance of bronchitis and broncho-pneumonia. No fibrin could be detected in any of the alveoli.

Bacteriological Report (the lung).—Many colonies of the pneumococcus were obtained, also many of *Staphylococcus citreus*, and some few of *Staphylococcus aureus* (three colonies of *Bacillus coli* also appeared, but their presence had no significance). The mouse died within forty-eight hours, of general pneumococcic infection.

OBSERVATION IV.—*Bronchitis—Broncho-Pneumonia.*

Elsie Warrington, 7 months. Brought up dead to the Hospital.

Post-mortem Report.—Child much wasted. The lungs showed a little collapse, and presented a patchy appearance, which suggested finely disseminated broncho-pneumonia, though it was by no means typical of it. They were also firmer than natural, and rather friable. Other organs all natural.

Microscopical Examination confirmed the diagnosis of broncho-pneumonia. The bronchi were much inflamed, their epithelium being shed, and their lumen full of inflammatory cells and exudation. Patches of broncho-pneumonia were also scattered over the section, the inflamed alveoli containing many epithelial cells and leucocytes. No fibrin was present.

Bacteriological Report.—No pneumococci or ordinary pathogenic micro-organisms were present. There were, however, the following microbes:—

(1.) Several colonies of a bacillus which, when injected sub-

cutaneously into mice, caused death by general infection. It was very motile, and stained by Gram's method. Its cultural features and biological characters proved it, however, not to be one of the ordinary pathogenic micro-organisms. In the absence of other pathogenic microbes, the broncho-pneumonia in this case must be ascribed to this micro-organism.

(2.) A fair number of colonies of a Gram-staining streptococcus, obviously from its colonies not *Streptococcus pyogenes* or the pneumococcus. It was non-pathogenic to mice when injected subcutaneously, and was probably therefore a saprophyte.

(3.) One colony of *Bacillus coli*; and

(4.) One colony of *Proteus*.

OBSERVATION V.—*Acute Bronchitis—Broncho-Pneumonia.*

George Lawson, 1 year. Patient was admitted on the fourth day of his illness, with cough, dyspnoea, and the signs of bronchitis. He got worse. Signs of consolidation of the lung appeared, and he died two days later, on the sixth day of the disease.

Post-mortem Report.—Both lungs were thickly sprinkled over with patches of collapse and broncho-pneumonia, and at the left base the patches had run together, so that almost the whole of the lower lobe was in a condition of consolidation. The other organs were all natural.

Microscopical Examination.—The specimen showed typical bronchitis and broncho-pneumonia. Weigert's staining showed that a few of the alveoli contained fibrin, though the majority did not.

Bacteriological Report.—The agar tubes showed a pure culture of the pneumococcus. The mouse died in forty-eight hours, its peritoneal fluid swarming with this micro-organism.

OBSERVATION VI.—*Acute Bronchitis—Broncho-Pneumonia.*

Mabel Fowkes, 1¼ years. Patient died in the Hospital on the fourteenth day of her illness, with the signs and symptoms of acute bronchitis and broncho-pneumonia.

Post-mortem Report.—The lungs were found sprinkled thickly throughout with patches of broncho-pneumonia and collapse.

Microscopical Examination.—The usual appearances of bronchitis and broncho-pneumonia were present. Some of the inflamed alveoli contained a network which looked like fibrin, but which was decolorised by Weigert's method. Possibly it was fibrin somewhat altered and degenerated in the process of absorption.

Bacteriological Report.—None of the micro-organisms usually found were present in this case. The agar cultures revealed—

(1.) Many colonies, exactly resembling in appearance those of the pneumococcus, *i.e.* small, flat, and transparent. They, however, consisted of bacilli which did *not* stain by Gram's method. Subcultures also were unsuccessful, though attempts were made to grow them on agar, gelatine, and Kanthack's serum agar. The inoculated mouse died ten days after it had been injected, but nothing could be found either in its blood or peritoneal exudation.

(2.) Many colonies of a saprophytic staphylococcus were also found. It was non-Gram-staining, and was non-pathogenic to mice.

The bacteriological report, therefore, in this case was unsatisfactory. Whether or not microbe 1 was pathogenic and the cause of the broncho-pneumonia in this case could not be proved, since it could not be grown on ordinary media.

OBSERVATION VII.—*Acute Bronchitis—Broncho-Pneumonia.*

Mary Ann Seabright, 3 years. The child was brought to the Hospital suffering from bronchitis. She was very ill, and died shortly after admission.

Post-mortem Report.—The autopsy showed bronchitis and disseminated broncho-pneumonia. The right upper lobe also was collapsed by a localised pleural effusion, and some scattered lymph was present over the right base. The other organs were all natural.

Microscopical Examination.—This confirmed the naked-eye diagnosis. Many of the inflamed alveoli contained a network of fibrin, which was well demonstrated by Weigert's method.

Bacteriological Report.—Numerous colonies of typical *Streptococcus pyogenes* developed. They answered all the tests enumerated above, including the injection test (the cocci found in the inoculated animal possessed *no* capsule). The mouse also inoculated with the lung exudation remained well, thus proving the absence of pneumococci. (A single colony of *Staphylococcus aureus* developed also on one of the agar tubes. With this exception they gave a pure culture of the streptococcus.)

OBSERVATION VIII.—*Acute Bronchitis—Broncho-Pneumonia.*

Walter Rogers, 4 years, was admitted five days before death with symptoms of meningitis. During life nothing abnormal could be discovered in the lungs, and the case was regarded as one of simple tubercular meningitis.

Post-mortem Report.—The tracheal glands were caseous, and tubercular meningitis was present. The lungs showed a few grey miliary tubercules scattered through them, and in addition throughout both lungs were patches of broncho-pneumonia. In the lower lobes these patches had coalesced, and the condition was one of pseudo-lobar pneumonia. The report states that “the appearance of the patches was not at all like that of tuberculous broncho-pneumonia, but was that of a simple broncho-pneumonia.”

Microscopical Examination.—This confirmed the fact that the broncho-pneumonia was simple, not tubercular. There was no evidence anywhere of caseation, and two specimens stained for the tubercle bacillus failed to reveal any. The inflamed alveoli contained much fibrin.

Bacteriological Report.—Many colonies of the pneumococcus were obtained in the tubes. The mouse also died in forty-eight hours of general pneumococcic infection

[The following colonies were also obtained, but were too few in number to have any importance in this case :—

- (a.) One colony of *Staphylococcus aureus*.
- (b.) Eight colonies of an organism belonging to the coli group.
- (c.) A few colonies of an undescribed non-pathogenic non-Gram-staining staphylococcus. It was not the same as that described in Observation I. It was without doubt a saprophyte.]

OBSERVATION IX.—*Morbus Cordis—Slight Hydrothorax—Bronchitis—Broncho-Pneumonia.*

Herbert Roberts, 13. Patient was in the Hospital for some weeks suffering from morbus cordis, bronchitis, and general anasarca. He did not improve, and finally died, the bronchitis continuing until the end.

Post-mortem Report.—The heart, which was greatly hypertrophied (36 oz.), showed old valvular lesions. There was some little fluid in both pleural cavities, and the bases of both lungs were solidified—a piece which was cut off sinking in water. It was not, however, mere collapse from pressure, for the section was patchy in appearance and rather friable. It suggested strongly broncho-pneumonia.

Microscopical Examination.—This confirmed the naked-eye diagnosis. The bronchi were found inflamed and full of secretion, and patches of consolidation were scattered about the section. The inflamed alveoli contained mostly leucocytes, but a few larger epithelial cells were also present. *No fibrin* was visible.

Bacteriological Report.—A pure culture of the pneumococcus was obtained. The mouse died within forty-eight hours, of general pneumococcic infection.

OBSERVATION X.—*Chronic Parenchymatous Nephritis—
Bronchitis—Broncho-Pneumonia.*

Jesse Williams, 17. Patient was in the Hospital for six weeks before death, suffering from chronic parenchymatous nephritis, complicated towards the end by some bronchitis. He finally became drowsy, and died comatose (uræmia).

Post-mortem Report.—The kidneys were large and white, and showed, in addition, a little recent inflammation. There was some hypertrophy of the left ventricle, and a little recent pericarditis. The lungs were both of them very œdematous and congested at their bases behind, and some recent adhesions were found over both lower lobes. The lungs, however, in addition to being œdematous, were firmer than natural, rather friable, and patchy in appearance, suggesting scattered broncho-pneumonia.

Microscopical Examination confirmed this view. The bronchioles were denuded of epithelium, and surrounded by patches of inflamed alveoli. These alveoli contained mostly leucocytes, but also some larger epithelial cells. No fibrin was present.

Bacteriological Report.—The cultures showed—

(a.) Many colonies of *Streptococcus pyogenes*.

(b.) A few of *Staphylococcus aureus*.

(c.) The mouse died on the eleventh day after injection, with general pneumococcic infection, thus proving the presence of the pneumococcus, though its colonies had been overlooked.

The following saprophytes were also present—

Five colonies of *Bacillus coli* and a few of a non-motile bacillus, which was non-pathogenic to mice.

OBSERVATION XI.—*Chronic Bronchitis—Emphysema—Broncho-Pneumonia.*

George Edwards, 29. The patient was in the Hospital for nearly three weeks before his death, suffering from continuous pyrexia and much bronchitis.

Post-mortem Report.—The lungs showed themselves to be in a condition of chronic bronchitis and emphysema. Both bases also were very œdematous and rather congested, and showed

scattered about lighter patches of broncho-pneumonia. The right heart was rather dilated. All else was natural.

Microscopical Examination.—The bronchi were inflamed and full of secretion. The pneumonic patches contained in the alveoli leucocytes, catarrhal cells, and a few red corpuscles. No fibrin was present.

Bacteriological Report.—Innumerable colonies of the pneumococcus developed on the agar tubes. The mouse also died within forty-eight hours, of general pneumococcic infection. The following colonies also developed, but their relation to the broncho-pneumonia was, doubtless owing to their small number, unimportant—

- (a.) Eight colonies of *Staphylococcus aureus*.
- (b.) One colony of *Streptococcus pyogenes*.
- (c.) Four colonies of *Torula Alba*.

BRONCHO-PNEUMONIA OCCURRING IN THE COURSE OF DIPHTHERIA.

OBSERVATION XII.—*Diphtheria (Throat and Larynx)*—*Broncho-Pneumonia*.

James Giles, 4½. Admitted with diphtheria both of the throat and larynx. Tracheotomy was performed, but the child sank, and died on the eighth day of the disease.

Post-mortem Report.—Uvula covered with membrane. Palate also much congested and swollen. Larynx, trachea, and bronchi showed *no membrane post-mortem*.

Lungs: The lower lobes of both lungs showed extensive broncho-pneumonia. They were, in fact, in a condition of pseudo-lobar pneumonia. Other organs all natural.

Microscopical Examination confirmed the naked-eye diagnosis. A considerable number of the inflamed alveoli showed a good fibrin network.

Bacteriological Report.—(1.) Many colonies of the pneumococcus were found. The mouse also died in forty-eight hours, of general pneumococcic infection.

(2.) Many colonies of the diphtheria bacillus were obtained on tubes of serum agar, which had been inoculated as well as the agar tubes.

(3.) *Bacillus coli communis* was also present in considerable numbers.

No streptococci were present.

OBSERVATION XIII.—*Measles—Diphtheria—Broncho-Pneumonia.*

John Churchill Field, 3. Patient caught measles, and was then also attacked by diphtheria. He died shortly after being brought to the Hospital.

Post-mortem Report.—The body was covered with a morbilliform rash. The left tonsil, larynx, and trachea (down to the bifurcation) were all covered with membrane, but *not the bronchi*. The lungs showed marginal collapse and scattered patches of broncho-pneumonia.

Microscopical Examination.—The usual lesions of bronchitis and broncho-pneumonia were seen. No fibrin was present.

Bacteriological Report.—(1.) Very many colonies of the diphtheria bacillus were obtained on Kanthack's serum agar.

(2.) Many colonies of *Streptococcus pyogenes* were also present. (A mouse inoculated with a pure culture died with general infection, but the cocci found in its tissues possessed *no capsule*.)

(3.) Pneumococci were also present. The mouse injected with the lung-juice died in forty-eight hours, of general pneumococcal infection (a superb capsule surrounding each microbe).

A few coli were also found.

PERTUSSIS—BRONCHO-PNEUMONIA.

OBSERVATION XIV.—*Pertussis—Bronchitis—Broncho-Pneumonia.*

Ethel Danham, 10 months. Patient was in the Hospital for ten days before death, suffering from severe bronchitis and whooping-cough.

Post-mortem Report.—The lungs showed acute emphysema, both alveolar and interstitial. The bronchi in places were markedly dilated. Patches of collapse were present, and there were scattered areas of broncho-pneumonia.

Microscopical Examination.—The lesions of bronchitis and broncho-pneumonia were well seen; some of the inflamed alveoli contained a very fine network which suggested fibrin. It would not, however, stain by Weigert's method (*cf.* Case VI.).

Bacteriological Report.—*Nothing* could be grown on the agar tubes, and tubercle bacilli could not be demonstrated in the sections. The mouse also inoculated with the pneumonic exudation did not die. It was not, however, a question of no microbes being present in this case, for sections of the broncho-pneumonic lung showed innumerable micrococci in the alveoli. They would not, however, grow on the ordinary media.

TUBERCULOUS BRONCHO-PNEUMONIA.

OBSERVATION XV.—*Acute Miliary Tuberculosis—Tuberculous Broncho-Pneumonia.*

Margaret Honnor, 1 year 11 months. Patient had had pertussis two months before death, and following this was attacked by general tuberculosis.

Post-mortem Report.—The bronchial glands were caseous. There were scattered tubercles in the spleen, liver, kidneys, and lungs, but the latter presented in addition the typical lesions of tuberculous broncho-pneumonia.

Microscopical Examination.—The bronchi were inflamed and full of secretion. The broncho-pneumonic patches were numerous, and many were caseating in their centre. Around this the inflamed alveoli were filled with a *beautiful fibrin network*, and contained leucocytes, red blood-corpuscles, and some epithelial cells. The fibrin stained well with Weigert's method.

Bacteriology.—1. Many tubercle bacilli were found in the sections, especially in the caseated parts.

2. Many colonies of the pneumococcus grew on the agar tubes *nil* else. The inoculated mouse died on the sixth day, with general pneumococcic infection.

OBSERVATION XVI.—*Tuberculous Broncho-Pneumonia with Secondary General Tuberculosis.*

Johannah Donovan, 4. Patient died on the day of admission. The cough had begun six months ago, while during the last two months there had been rapid wasting.

Post-mortem Report.—Both lungs showed scattered tuberculous broncho-pneumonia; also the lower lobe of the right lung showed a small spherical cavity with softened caseous contents. The tracheal and bronchial glands were enlarged and caseous. Miliary tubercles were present in the meninges, spleen, and lung.

Microscopical Examination.—The appearance closely resembled that described in the last case. Many of the alveoli here again were filled with a *beautiful fibrin network*.

Bacteriology.—The broncho-pneumonic patches, especially the caseating parts, were crowded with tubercle bacilli. Nothing developed on the tubes except a very few colonies of non-pathogenic saprophytes (among which were two colonies of *Bacillus coli*). The injected mouse also showed no ill effects.

OBSERVATION XVII.—*Phthisis—Tuberculous Broncho-Pneumonia.*

Charles Barrett, 52. Patient died of phthisis. It had doubtless existed for a long time, but towards the end it extended rapidly.

Post-mortem Report.—Right lung: A few miliary tubercles were present, chiefly grouped around the large bronchi.

Left lung: The apex contained several old cavities. The rest of the lung had numerous miliary tubercles scattered through it, while its base was in a state of pseudo-lobar pneumonia from patches of tuberculous broncho-pneumonia having run together.

Microscopical Examination showed bronchitis and typical tuberculous broncho-pneumonia. A superb fibrin network was here again present in many of the alveoli.

Bacteriology.—The sections showed a few tubercle bacilli scattered through them.

Nothing grew on the agar tubes, though they were incubated at 37° for three days aërobically, and then for three days anërobically (Buchner's method).

[The inoculated mouse died two days after it had been injected. The post-mortem was negative, and neither cover-glass preparations nor cultures revealed the presence of any micro-organism in its tissues.]

OBSERVATION XVIII.—*Phthisis—Caseous Tuberculous Broncho-Pneumonia.*

Emma Lowe, 59. Patient had had old tubercular mischief in the lungs for some time. She then had two attacks of hæmoptysis, after which the disease made rapid progress and the patient died.

Post-mortem Report.—Left lung: The apex contained a large irregular cavity. The rest of the lung was thickly sprinkled with caseating patches of broncho-pneumonia. This was especially the case in the lower lobe, which was thereby rendered nearly solid.

Right lung: The disease here was much less advanced. The apex contained a small cavity, and the upper lobe was sprinkled with grey tubercles.

Microscopical Examination.—Very similar appearance to that seen in the preceding cases. Again many of the alveoli showed a superb fibrin network.

Bacteriology.—(1.) A good many tubercle bacilli were demon-

strated by staining, both in the inflamed and also in the caseating portions of the broncho-pneumonic nodules.

(2.) Very many colonies of *Streptococcus pyogenes*, and also of

(3.) *Staphylococcus aureus* developed on the culture-tubes.

No pneumococci were present. The mouse died three days after its inoculation. Cocci were found in the blood, but these had *no capsule*, and were doubtless *Streptococcus pyogenes* or *Staphylococcus aureus*.

[The following saprophytes were also present:—(a) Three colonies of *Proteus*; (b) one colony of *Bacillus coli*; (c) two colonies of *Bacillus pyocyaneus*.]

The results obtained in the observations just quoted may be grouped together simply in the following table:—

Simple Broncho-Pneumonia.

Observation.	Age.	Bacteriology: The Pathogenic Microbes Found.	Presence or Absence of Fibrin in the Inflamed Alveoli.
I.	5 weeks.	Pneumococcus (many colonies).	None.
II.	10 weeks.	Pneumococcus (pure culture).	None.
III.	5 months.	Pneumococcus (many), Staph. pyog. citreus (many), Staph. pyog. aureus (few).	None.
IV.	7 months.	A pathogenic bacillus, described in text.	None.
V.	1 year.	Pneumococcus (pure culture).	A few alveoli contained fibrin.
VI.	1½ years.	Indefinite (<i>v. text</i>).	? Altered fibrin (<i>v. notes</i>).
VII.	3 years.	Streptococcus pyog. (pure culture).	Some fibrin.
VIII.	4 years.	Pneumococcus (many).	Much fibrin.
IX.	13 years.	Pneumococcus (pure culture).	None.
X.	17 years.	Pneumococcus, Streptococcus pyog. (many), Staph. pyog. aur. (few).	None.
XI.	29 years.	Pneumococcus (innumerable), Staph. aur. (8 cols.), Strep. pyog. (1 col.).	None.

Broncho-Pneumonia occurring in the Course of Diphtheria.

XII.	4½ years.	Diphtheria bacilli (many), Pneumococcus (many), (<i>Coli communis</i>).	A good deal was present.
XIII.	3 years.	Diphtheria bacilli (many), Streptococcus pyog. (many), Pneumococcus (a few).	None.

Broncho-Pneumonia following Pertussis.

Observation.	Age.	Bacteriology: The Pathogenic Microbes Found.	Presence or Absence of Fibrin in the Inflamed Alveoli.
XIV.	10 mos.	None grew (<i>v. notes</i>).	? Altered fibrin (<i>v. notes</i>).

Tuberculous Broncho-Pneumonia.

XV.	1 yr. 11 m.	Tubercle bacilli (many), Pneumococcus (many).	A good deal of fibrin present.
XVI.	4 years.	Tubercle bacilli (very many). <i>Nil</i> else.	Much fibrin.
XVII.	52 years.	Tubercle bacilli (few). <i>Nil</i> else.	Much fibrin.
XVIII.	59 years.	Tubercle bacilli (fair number), Streptococcus pyog. (very many), Staph. aur. (many).	Much fibrin.

ANALYSIS OF RESULTS OBTAINED AND COMPARISON WITH THOSE OF OTHER OBSERVERS.

I. *Primary Broncho-Pneumonia.*

From the above results it is seen that simple broncho-pneumonia, whether occurring in the infant or the adult, is far most frequently caused by the pneumococcus. Thus, of 11 cases examined, 8, or 72 per cent., contained the pneumococcus, whilst in 5 of these, or 45 per cent., it was present in practically a pure culture.

Other microbes, however, *may* be responsible for the broncho-pneumonia. For example, in Observation VII. the *Streptococcus pyogenes* was the cause, while in Observation IV. a pathogenic microbe of an unusual kind, and which was presumably the cause of the broncho-pneumonia, was found.

The staphylococci (*aureus albus* and *citreus*) were never found in pure culture in any of my cases. When present, they were always associated with other pathogenic microbes. They cannot, therefore, be regarded as having directly caused the broncho-pneumonia in any of my observations, though doubtless they played a secondary rôle in keeping it up when the inflammation of the alveoli had once been started.

Friedländer's *Bacillus pneumoniae* was never observed.

Let us now consider how these results harmonise with those of former observers.

The first writer who published results on the bacteriology of acute primary broncho-pneumonia was *Weichselbaum*^{31(a)} in 1886. He examined (in Vienna) 15 cases, and found the cause to be—

The pneumococcus	7 times
The streptococcus	6 times
Bacillus pneumoniae (Friedländer's)	1
The pneumococcus + staphylococcus	1

In 1889 *Queissner*²⁷ examined one case, and found it to be due to the pneumococcus.

*Neumann*²¹ also, in 1889, examined 7 cases in Berlin, and in 4 found the pneumococcus.

Finkler^{8(a)} in 1890 reported on 5 cases from Wiesbaden. He found—

The pneumococcus (pure culture) in	1
The pneumococcus + streptococcus in	1
The pneumococcus + staphylococcus in	2
Friedländer's bacillus + streptococcus in	1

In 1891 *Mosny*^{18(a)(b)} (Paris) examined 4 cases and found—

The pneumococcus (pure culture)	3 times
The streptococcus (pure culture)	1

We now come to *Netter's*¹⁹ very important results, published in 1892. He examined in Paris 48 cases of primary broncho-pneumonia, and found that the pneumococcus, the streptococcus, the staphylococci, and Friedländer's bacillus were all capable of causing the disease, but that the most frequent cause was the pneumococcus, the next most frequent the streptococcus, while Friedländer's bacillus and the staphylococci were not so often found.

Lastly, in the present year (1897) are recorded from America the results of *Wollstein*³³. Eighteen cases of primary broncho-pneumonia were examined—

The pneumococcus (pure culture) was found in 9 cases	
The streptococcus (pure culture)	2 ..
The pneumococcus + streptococcus	7 ..

Conclusion.—It is thus seen that these observations (98 in all), whether coming from the different countries of Europe or from America, agree for the most part well among themselves and with my own observations.

All agree that the pneumococcus is by far the most frequent cause of primary broncho-pneumonia, and that next to this, though at a great distance, comes the *Streptococcus pyogenes*. The staphylococcus is only very rarely found in pure culture. Occasionally also, though rarely, other microbes may be responsible for the pneumonia, such as, for example, Friedländer's bacillus, or other less well-known micro-organisms.

II. *Secondary Broncho-Pneumonias.*

At the present time it is held by many that the broncho-pneumonias occurring in the course of specific fevers are brought about, not by the micro-organisms which themselves cause the various fevers, but by a concurrent or subsequent infection from the mouth and bronchi by the ordinary pyogenic micro-organisms which are often normally present there,* and especially of the streptococcus. In short, these broncho-pneumonias are by many regarded as being due to a *heterologous*, and not a *homologous* infection—terms with which Dr. Kanthack has already made us familiar at St. Bartholomew's.

This view until recently had been gradually accepted on the basis of a large number of bacteriological observations, and I propose now to discuss the question whether, in the light of newer observations, it can any longer be maintained.

It is unnecessary to point out that the question is not merely an academic one, but one of considerable *clinical* importance. For if the broncho-pneumonia is caused directly by the microbe of the specific fever, it necessarily means that the hold which the parasite has obtained over the organism must be very great, while the opportunities for forming increased quantities of toxin are proportionately increased.

First, with regard to—

(a.) *Diphtheritic Broncho-Pneumonia.*

A very large number of observations have been made on this variety of broncho-pneumonia, and they may be divided into two classes:—

(1.) Those made between 1885, when the first results were published, and 1895.

(2.) Those since that date.

* *Netter*²⁰ examined the saliva of 127 healthy people. He found the staphylococcus almost constantly. The pneumococcus in 20 per cent. of the cases, the streptococcus in 5.5 per cent., and Friedländer in 4.5 per cent. For reasons which he gives, these results may be considered considerably below, not above, the mark.

With regard to the first group, the following are the chief papers:—

In 1885 *Darier*⁶ examined 4 cases, and found the *streptococcus* in all, once in pure culture, once with the diphtheria bacillus, and twice with *Staphylococcus aureus* and *albus*.

In 1889 *Prudden* and *Northrup*²⁶ examined 17 cases, and in every one found the *streptococcus*, in 4 cases in pure culture, in 13 united with *Staphylococcus aureus*. In no case did they find the diphtheria bacillus.

*Queissner*²⁷ in the same year reported on two more cases, with a similar result.

In 1891 *Strelitz*³⁰ examined 8 cases, and only in one obtained the diphtheria bacillus. The other 7 showed streptococci, pneumococci, Friedlander's bacillus, and staphylococci.

Mosny^{18(a)} also, in 1891, examined 3 cases. He found the *streptococcus* in all, and once only the diphtheria bacillus as well.

In 1892 *Netter*¹⁹ reported on 7 cases. In all he found the *streptococcus*, but associated four times with the diphtheria bacillus, and sometimes also with the pneumococcus, Friedländer's bacillus, or the staphylococci.

Lastly, in 1893, *Flexner*⁹ examined 2 cases. One contained the pneumococcus in pure culture, the other the pneumococcus and the diphtheria bacillus.

If now we add these results together, we find that 43 observations have been collected, and that the *streptococcus* was present 35 times (*i.e.* in 81 per cent. of the cases), and 7 times in pure culture.

The diphtheria bacillus was found only 8 times, *i.e.*, in 18 per cent. of the cases (as opposed to 81 per cent. of the streptococcus), and never in pure culture, 6 times being associated with the streptococcus, once with the pneumococcus, and once with staphylococcus.

Conclusion derived from early observations.—What wonder, then, that the opinion came to be held that the broncho-pneumonia of diphtheria was caused not by the diphtheria bacillus, but by a secondary infection, generally of *streptococci*, and that those few cases in which the diphtheria bacillus was found were regarded as cases in which the membrane itself had spread right down the bronchi into the lung.

And yet there is no doubt that, in the majority of cases, as indeed *Kanthack*^{12(b)} has already pointed out, this view is incorrect, for since 1895 three papers have appeared which quite change the aspect of the case. The first of these was published in 1895 by *Belfanti*.⁴ He gives in it the results of 26 observations on diphtheritic broncho-pneumonia.

In opposition to all hitherto published results, he found the diphtheria bacillus in 21 of them, and more important still, four times in pure culture. In the other cases it was associated as usual with the streptococcus, pneumococcus, staphylococcus aureus, or with Friedländer's bacillus, though most frequently with the first of these.

These very striking results, however, did not long stand alone, for almost simultaneously with the publication of Belfanti's results a paper appeared in America on the same subject by *Wright and Stokes*³². These authors examined 19 cases of diphtheritic broncho-pneumonia, and in 18 of these the diphtheria bacillus was found, and in 8 it was *the only organism present*. The streptococcus was found combined with it nine times. Once only was the latter present in pure culture.

In 1896 also these results were amply confirmed by *Kanthaek and Stephens*^{12(b)}, who in 15 cases of macroscopic diphtheritic broncho-pneumonia found the diphtheria bacillus in every case (other micro-organisms not being attended to).

In my own two observations, XII. and XIII., the diphtheria bacillus was present in each case, but in neither was it a pure culture.

If, now, we add these results together, we find that in the last two years 62 cases have been examined, and that in 56 of them, or 90 per cent., the diphtheria bacillus was present, and in 12 of them *at least*, or 19 per cent., it was in pure culture.

General Conclusion.—These results seem absolutely conclusive. Based on more delicate methods, they prove that, contrary to the usually accepted opinion, the *broncho-pneumonia occurring in diphtheria* is, in the vast majority of cases, *no* manifestation of a secondary infection by streptococci or other microbes, but is *really part of the disease itself*, being *caused by the diphtheria bacillus*, though, just as in the case of the membrane in the throat itself, the inflammation thus set up may be aggravated by the *subsequent* growth of other micro-organisms. In some *few* cases, however, the disease may be non-diphtheritic, and set up simply by the pyogenic micro-organisms.

(b.) *Influenzal Broncho-Pneumonia.*

What has just been said about diphtheritic broncho-pneumonia might be applied with but slight alteration to the broncho-pneumonia occurring in the course of influenza.

Between 1889, when the first epidemic began, and 1893, when Pfeiffer announced his discovery of the influenza bacillus, a large number of papers were published, proving, as their

authors believed, that the streptococcus was generally the cause of the broncho-pneumonia, but that the pneumococcus, and more rarely Friedländer's bacillus or the staphylococcus, might also cause it, and hence that it was brought about by secondary infection.*

In 1893, however, Pfeiffer²³ discovered the influenza bacillus, and proved that if the patient died at the height of the disease, the smallest bronchi and the patches of broncho-pneumonia presented a pure culture of the microbe, though the trachea and large bronchi might contain the pneumococcus and streptococcus as well. If, however, the patient lived longer, then, just as in diphtheria, the pneumococci and streptococci, &c., normally present in the mucus of the larger bronchial tubes, germinated rapidly, penetrated subsequently into the already inflamed alveoli, and a mixed flora was obtained. These observations of Pfeiffer have since been confirmed, and may be accepted.

Conclusion.—Hence, in the case of influenza, just as in the case of diphtheria, we must regard the broncho-pneumonia as most commonly, though not perhaps in all cases, part of the primary disease, due to the bacillus which causes the influenza itself, and not to any secondary infection by other microbes, though these may, in this case also, aggravate an inflammation already produced without their aid. Occasionally, however, the inflammation may be really heterologous—set up, that is to say, simply by the pyogenic microbes.

(c.) *The Broncho-Pneumonia occurring in Measles.*

It would be useless to delay long over this variety of broncho-pneumonia, for the microbe responsible for the measles itself has yet to be discovered. It is impossible, therefore, to say whether it may or may not be present in the pneumonic patches, either alone or associated with other pathogenic micro-organisms. That the latter are often present is shown by the following results.

In 26 cases collected from the literature †—

The streptococcus was found	14	times ;	in pure culture	8	times.
The pneumococcus	12	„	„	9	„
The staphylococcus	4	„	„	2	„
Friedländer's bacillus	2	„	„	1	„

* The papers to which reference is here made are by the following authors :—1890, Prior²⁴ (5 cases), Weichselbaum^{31(b)} (2), Ribbert²⁸ (6), Leyden¹⁵ (2), Prudden²⁵ (1), Levy¹⁴ (1); 1891, Finkler^{8(b)} (32); 1892, Netter¹⁹ (8).

† Reference is here made to the papers of Guarnieri¹⁰ (1 case), Queissner²⁷ (3), Neumann²¹ (6), Morel¹⁷, Mosny^{18(a)} (9), Finkler^{8(a)} (3), Netter¹⁹ (4).

Those who are responsible for these observations claim that the micro-organisms they have found are the direct cause of the broncho-pneumonia; but remembering the history of the diphtheritic and influenzal varieties, and the close connection which measles has with the respiratory passages, we may say that it is at least *as likely* that in many cases the broncho-pneumonia may be caused directly by the microbe of measles, and that only later, when the ground is thus prepared, do these pyogenic microbes invade the lung from the bronchial tubes. They would thus assist in keeping up the inflammation, but would not be the direct exciting cause.

(d.) *Broncho-Pneumonia occurring in Pertussis.*

Here, too, as in the case of measles, we must withhold our judgment until the microbial cause of the disease has been discovered. The pyogenic micro-organisms have been discovered in the pneumonic patches, but whether or not they are the real cause of the disease cannot yet be determined.

(e.) *Broncho-Pneumonia occurring in Typhoid Fever.*

So far, then, evidence has been adduced showing that there is strong reason to believe that in the case of diphtheria and influenza the usually accepted view as to the etiology of broncho-pneumonia is incorrect.

It has been shown also that in the case of measles and pertussis it is impossible as yet to form an opinion. It must not be supposed, however, that the usually accepted opinion is totally incorrect. This is not so; and we must now discuss shortly a variety of broncho-pneumonia which seems without doubt to be really due to a secondary infection, namely, that variety occurring in the course of typhoid fever. This, though a very rare complication in England, is by no means so rare on the Continent, where the hygienic condition of the wards leaves much to be desired.

The results of the bacteriological examination in fifteen cases have been collected, and are here given.

In 1886 *Neumann*²¹ examined one case, and found streptococci in pure culture in the lung. No typhoid bacilli were found.

In 1890 *Banti*² examined two cases. In one the pneumococcus was found in pure culture, and in the other the streptococcus + the staphylococcus. The typhoid bacillus was found in the spleen, but *not* in the lung.

In 1892 *Netter*¹⁹ reported on eight cases, and found in them most frequently the pneumococcus, but also the streptococcus, staphylococcus, and Friedländer's bacillus, but *never* the typhoid bacillus.

Lastly, *Silvestrini*²⁹ examined six cases, and found in them streptococci and staphylococci, but never once the typhoid bacillus.

In addition to these published cases, Dr. Kanthack informs me that in four cases in which he examined the diseased lungs thoroughly, employing Elsner's method, he never once found Eberth's bacillus, but only pyococci and varieties of bacillus coli.

Remembering now that the typhoid bacillus is one not readily overlooked—indeed, from its resemblance to bacillus coli, it is far more often described when not really present than overlooked—the above results tend to prove that the broncho-pneumonia occurring in typhoid fever is really brought about, not by the typhoid bacillus, but by a secondary infection of pneumococci, streptococci, &c., from the bronchi. And indeed this is really what might be expected, if we consider the matter, for whereas normally the diphtheria and influenza bacilli are definitely associated with the respiratory tract, this is not the case with the typhoid bacillus. Hence it is not surprising to find that the broncho-pneumonia of typhoid fever, unlike that of diphtheria or of influenza, is really an example of a heterologous infection.

(*f.*) *Broncho-Pneumonia occurring in the Course of Scarlet Fever.*

The observations of *Mosny*,¹⁸ *Wright* and *Stokes*,³² and others, show that the pyogenic cocci, and especially the streptococci, are to be found in the inflamed alveoli. Possibly, as in typhoid fever, they are really the cause of the pneumonia, but until more is known about the bacteriology of scarlet fever, no definite conclusion can be reached.

General Conclusion as to "Secondary" Broncho-Pneumonias.

The general conclusion, therefore, that may be arrived at from this study of these so-called "secondary" broncho-pneumonias is as follows:—

1. The broncho-pneumonias occurring in the course of infectious diseases are *not* all examples of heterologous secondary infection, as is usually supposed. Thus the broncho-pneumonias of *diphtheria* and *influenza* are undoubtedly, in the *majority of cases*, caused by their own specific microbes, and are thus

examples of *homologous infection*. The specific microbes are often assisted by the pyogenic micro-organisms, but only in very rare cases are the latter solely responsible for the pneumonia, which is then really due to a heterologous infection.

With regard to the broncho-pneumonias occurring in *measles* and *pertussis*, no definite statement can as yet be made. The pyogenic cocci are very commonly found in them, but, as in the case of diphtheria and influenza, the broncho-pneumonias may eventually turn out to be homologous, due, that is to say, to the specific microbes of the diseases in question, the pyogenic cocci having only later invaded the inflamed alveoli.

Lastly, the broncho-pneumonia which sometimes occurs in *typhoid fever* is, with little doubt, really brought about by a heterologous infection, and is *not* caused by the typhoid bacillus.

Possibly, also, the broncho-pneumonia occurring in the course of *scarlet fever* should be included in this class.

(a.) *Tuberculous Broncho-Pneumonia.*

It may be mentioned first, that reference is here made to those acute or sub-acute broncho-pneumonias, which occur especially in patients already the subject of tubercular disease of the lung, which show some slight caseation post-mortem, and which are therefore commonly regarded as tubercular, and through the caseation and breaking down of which the disease makes rapid progress.

Now of late years the view long held, that these acute tuberculous broncho-pneumonias were caused entirely by the tubercle bacillus has been attacked. Recent writers, such as *Babes*,¹ *Cornet*,⁵ and notably *Ortner*²² (working in Weichselbaum's laboratory), have attempted to prove that it is really brought about by a mixed infection—the *inflammation* being produced by the pyogenic micro-organisms, and that the secondary *caseation* alone is the work of the tubercle bacillus.

The subject is of extreme importance both from a pathological and also from a clinical point of view, having regard to the introduction of serum therapeutics, and the adequate treatment of it would require a separate paper. I will, therefore, only mention here, that of the four cases examined by myself (Observations XV.—XVIII.)—

- Two *apparently* contained the tubercle bacillus in pure culture (Observations XVI. and XVII.), neither cultures nor inoculation revealing the presence of other microbes; while
- One contained the tubercle bacillus + the pneumococcus, and
- One the tubercle bacillus + streptococcus + staphylococcus.

Microscopical Appearance—Presence of Fibrin.

Lastly, one word may be said as to the microscopical appearances presented by the various broncho-pneumonias.

It has now for some time past been recognised that it is incorrect to state, as was formerly the custom, that in all cases of broncho-pneumonia the alveoli contain simply leucocytes and epithelial cells. Indeed, many of the text-books on Pathology* now admit that the distinction between lobar and lobular pneumonia is by no means so definite as was once thought, and that in many cases of broncho-pneumonia some of the alveoli, especially those in the acute stage, possess a fibrin network and contain red corpuscles, thus presenting an appearance very similar, if not identical, to that of alveoli in the stage of red hepatization.

Now this question of the relationship of acute broncho-pneumonia to lobar pneumonia is one to which Professor Kanthack has been lately devoting particular attention. With regard to the fibrin network, he recently demonstrated a series of specimens before the Pathological Society of London, showing that it was present in many alveoli in cases of diphtheritic broncho-pneumonia, and he has since shown the same to be the case in other broncho-pneumonias. One point, however, remains to be worked out, namely, whether the presence of the pneumococcus, which, as we have seen, is often present in secondary broncho-pneumonias, in addition to the specific microbe, is or is not essential for the formation of a fibrin network. That is to say, whether cases of broncho-pneumonia in which the diphtheria bacillus, streptococcus, &c., were present *in pure culture* can also show the network, proving that the inflammation is similar in nature in all cases, whatever the bacterial cause.

The observations quoted in this paper, few in number though they are, tend to show that this is the case.

For example—

Observation VII. showed a good fibrin network, while the broncho-pneumonia was caused by the streptococcus in pure culture.

Observations XVI. and XVII. showed a very abundant network, though the tubercle bacillus was the only one whose presence could be demonstrated, while, with regard to diphtheritic broncho-pneumonia, *Belfanti*⁴ has shown that a fine fibrin net-

* Vide Ziegler, 8th edit., 1896; Coats, 3rd edit., 1895; Letulle, Anatomie Pathologique, 1897.

work may be present in cases in which the diphtheria bacillus alone could be found.

That acute broncho-pneumonias set up by the pneumococcus in pure culture show, as might be expected, a fibrin network, is proved by Observations V. and VIII.

Thus it would seem that in *all* acute or sub-acute broncho-pneumonias, however caused, we may find *some* alveoli containing a fibrinous exudation, and really in a condition of hepatization. Further support is thus given to the view that there is *no inherent difference between the inflammatory lesions of lobar and acute lobular pneumonia*. To this point I shall hope to revert in a future communication.

Summary.

For purposes of convenience it may be well to group together briefly the conclusions which have been arrived at in this paper. They are as follows:—

1. Simple "primary" broncho-pneumonia is generally caused by the *pneumococcus*, though it may be caused by the *streptococcus*, and more rarely the *staphylococcus*. Occasionally also it may be due to other micro-organisms.

2. "Secondary" broncho-pneumonias, *i.e.*, those occurring in the course of infectious diseases, are *not all* caused by heterologous infection by streptococci, &c., as is usually held. Thus the broncho-pneumonias of *diphtheria* and *influenza* are for the most part caused by the diphtheria and influenza bacillus respectively, and are thus brought about by homologous infection. The broncho-pneumonia of *typhoid fever* is, however, an example of true heterologous infection being caused by the pyogenic micro-organisms.

Concerning the broncho-pneumonias of *measles* and *pertussis* and *scarlet fever*, it has been shown that no definite statement can as yet be made.

3. The presence of a fibrin network in the acutely inflamed alveoli is not confined to cases of acute broncho-pneumonia due to the pneumococcus. It may also be seen in acute cases caused by the streptococcus, the diphtheria bacillus, and the tubercle bacillus, all apparently in *pure culture*. It is thus a not uncommon manifestation of acute broncho-pneumonia, and the connection, therefore, between broncho-pneumonia, however caused, and lobar pneumonia is thus rendered closer.

In conclusion, I venture, after comparing my own results with the unpublished observations of Professor Kanthack, and, indeed, at the latter's suggestion, to offer the following classifi-

cation of acute broncho-pneumonias, showing in a tabulated form the present state of our knowledge as regards the bacteriology of the disease.

Acute Broncho-Pneumonia.

I. *Primary*—

- (a.) Pyococcal . . . $\left. \begin{array}{l} \text{Pneumococcus} \\ \text{Streptococcus} \\ \text{Staphylococcus} \end{array} \right\}$ or mixed.
 (b.) Tubercular Tubercle bacillus.

II. *Occurring in the course of infectious diseases.*

1. Diphtheria . . . $\left. \begin{array}{l} \text{Diphtheritic (Diphtheria bacillus, homologous infection).} \\ \text{Pyococcal (rare) (heterologous infection).} \\ \text{Mixed diphtheritic and pyococcal (mixed infection).} \end{array} \right\}$
 2. Influenza . . . $\left. \begin{array}{l} \text{Influenzal (homologous infection).} \\ \text{Pyococcal (rare) (heterologous infection).} \\ \text{Mixed influenzal and pyococcal (mixed infection).} \end{array} \right\}$
 3. Tuberculosis . . . $\left. \begin{array}{l} \text{Tubercular (tubercle bacillus) (homologous infection).} \\ \text{Pyococcal (heterologous infection).} \\ \text{Mixed tubercular and pyococcal (mixed infection).} \end{array} \right\}$
 4. Typhoid Pyococcal (heterologous infection).
 5. Scarlet Fever . . . Pyococcal }
 6. Measles Pyococcal } (provisionally).
 7. Pertussis Pyococcal }

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TWO CASES OF INTESTINAL RESECTION.

BY

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When House-Surgeon at St. Bartholomew's Hospital in 1890, I designed a decalcified bone tube for use in circular enterorrhaphy, and subsequently, in a series of experiments conducted at the laboratories of the Royal College of Surgeons, the results of which were published in the *British Medical Journal*, 1894, vol. ii. p. 65, demonstrated their utility in so far as the intestine of the dog was concerned. But it was only lately that I had an opportunity of applying the method, which I was convinced was a safe one and had many advantages over simple suture without possessing the disadvantages of other mechanical contrivances, to the case of a human patient.

The results of two cases in which I have recently performed the operation of circular enterorrhaphy at the Metropolitan Hospital, one for the union of the two ends of the intestine after the removal of a loop of gangrenous bowel from a strangulated inguinal hernia, and the other for the cure of an artificial anus of long standing which had defied all other means of treatment, have more than confirmed the good opinion which I had formed of the method on experimental grounds, and I think fully justify my calling attention to it in the Hospital Reports, and advocating its future use in similar cases.

I may say at once that I claim to have initiated no fresh principle, but merely to have added a few new points of detail—points which, however, appear to me to be essential to success.

There is nothing new under the sun, and the use of a tube in intestinal resection is indeed no exception to the rule. As early as the thirteenth century it is recorded that "The Four Masters," monks of pious memory, made use of the trachea of a calf. Bell used a cylinder of tallow; and Duverger in 1745 mentions a successful case in which the tube was made of pasteboard. In 1838, Denans employed three metal cylinders which

anticipated in all essential details the principles of Murphy's button, and, with a few modifications, I do not feel sure that it would not even now form a more suitable contrivance.

Many other substances have from time to time been recommended, such as raw hide and turnip, but it is to Neuber in 1884 that, I believe, we owe the introduction of decalcified bone. Senn's plates for lateral anastomosis were manufactured from the same material, and Paul in 1891 and Jessett in 1892 advocated the use of tubes of a similar substance.

Others have followed since with rings, and buttons, and bobbins, and plates, to which they are anxious to attach their names, but the man who adds a decalcified bone tube to the surgeon's armamentarium need not be puffed up with pride nor strive for precedence for his idea. After all, he is but applying a principle adopted by four nameless monks in the dark ages of the thirteenth century, and he has added nothing to the process by which the particular material he employs is prepared which was not bequeathed to him by Neuber.

Whether bone decalcified in nitric acid and hardened in absolute alcohol meets all requirements is by no means certain. For my own part, I am inclined to think that, unless made clumsily thick, the tubes are apt to soften a little too quickly. The length of time during which they remain efficient can only be determined by direct observation in the human subject; comparative results in animals are valueless, since the amount of intestinal digestion which goes on in various species is probably widely different. I may say in passing, that should it be found as a result of experience that ordinary decalcified bone is not sufficiently resistant to the intestinal juices, that it may be rendered so by hardening in chromic acid; or at any rate, that I have found that the longer it is immersed in that fluid, the longer up to a certain point will it retain its consistency when exposed to the action of an artificial digesting medium, kept at the temperature of the body in an incubator.

The tube, as I have employed it, is two inches long, with two grooves, each an eighth of an inch wide, running round the middle a quarter of an inch apart, the bone between them being on a slightly lower level than that beyond. Various sizes are kept in stock, as it is important that the tube should fit easily into the bowel without stretching it, and at the same time without leaving it too lax. With regard to the length, I have found that two inches allows the assistant to hold the gut readily without his fingers getting in the way; but if this for any reason seems too long, a piece can be easily cut off from either end with the knife, and the edges rounded at the time of the operation.

For full details with diagrams I must refer the reader to the original account in the *British Medical Journal*, but briefly the operation is performed as follows:—The intestinal contents being kept back by two pieces of rubber drainage-tube passed through the mesentery and tied round the bowel some distance above and below the site of operation, so as to be out of the way, and the necessary amount resected, a single stitch is passed at the mesenteric border through the whole thickness of both ends of the gut and tied, thus bringing the divided extremities together at their attached margin. This is important, as it not only prevents the peritoneum being stripped back, but also greatly facilitates the application of the circular ligatures at a subsequent stage of the operation.

The tube is now passed into the bowel, and when in position one end of the gut is brought well down over its corresponding groove and secured by a silk ligature passed through the gap in the mesentery, and made to encircle the whole circumference of the bowel in such a way that when tightly tied it lies within the groove. The part beyond the silk is then trimmed with scissors, so that only just sufficient is left to ensure the ligature holding. The other end is then treated in a similar way. A little difficulty may be experienced here in getting the ligature to include the whole circumference of the intestine, the part most liable to escape being the mesenteric border; but this entirely disappears if two little points which I have insisted upon be observed: firstly, the preliminary tying together of the ends by a suture at the mesenteric attachment; and secondly, the inclusion of a sufficient length beyond the circular ligatures, the excess being subsequently removed with the scissors.

At this stage the operation site should be thoroughly flushed with an antiseptic solution in order to remove any particles of faecal matter, &c., which may be present.

The assistant now grasps the intestine at a little distance from the ligatures, and by approximating his hands, brings the serous coats into contact in such a way that, if the proximal and distal portion of the gut are of equal calibre, a point an eighth of an inch above the upper meets a point a corresponding distance below the lower ligature, over the centre of the space between the grooves on the tube. If, however, there is great inequality in the sizes of the two portions of intestine, the smaller can be invaginated into the larger, and, as I previously pointed out, probably this manœuvre would be more easily carried out by using a conical instead of a cylindrical tube.

The serous coats thus approximated are fixed in position by a row of Lembert's sutures. In the case of small intestine, five

or six of these only will be required, one on each side close to the mesentery, which should be passed first, the remaining three or four round the rest of the circumference.

The chief advantages which I claim for a tube of this sort are—

(1.) That it provides the largest possible temporary channel for the passage of intestinal contents.

(2.) That till it softens, or the ligatures cut through, the escape of faecal matter is absolutely prevented.

(3.) That since the row of sutures takes no part in keeping the junction water-tight, a sufficient number to keep the parts in apposition only is required; and these being few and easily introduced, the time required for the operation is greatly diminished.

(4.) That the tube, having fulfilled its purpose, undergoes absorption and leaves no bulky mass to pass along the canal.

The first and last of these advantages attach to other forms of tube, but none, as far as I know, fulfils the other two also.

I am fully aware that there are some who object to the use of any kind of mechanical appliance whatsoever, and who claim to be able to insure with certainty a water-tight junction by the aid of sutures alone; but the anxious way in which they scrutinise the final result of their labours at the critical moment when the clamps are removed hardly suggests the confidence which their words profess. Others, again, have attained to such a degree of manual dexterity that they say they are able to stitch together the two ends of intestine as quickly without a tube as I can with. This means that they are able to put in two close rows of interrupted sutures, probably some forty or more, whilst I am tying two ligatures and putting in six stitches. I do not doubt the statement, but am left to wonder what fractional portion of the operation I should be able to complete whilst such skill was employed in the tying of two ligatures and introduction of six sutures.

I have heard the use of tubes condemned upon the grounds that when put away for a time they soften and become useless, and the same might be said of other surgical necessities. If not attended to, ligatures may become rotten or catheters crack; but this constitutes an argument for their proper preservation, and not for their abolition.

Still the objection is a more or less valid one, and I would here insert a word of caution to the man who lays in a stock of bone tubes. It is not sufficient merely to see that they are properly hardened when received from the maker, but they must be subsequently examined from time to time, and if found

to be softening at all, the absolute alcohol in which they are preserved must be changed.

Once a few elementary principles are recognised, intestinal surgery is one of the easiest branches of our art; and so strong is the tendency for divided portions to unite, that, notwithstanding the ingenuity of man, exercised to the full in the search for novelty in this particular direction, he does not appear to have been able to devise any procedure which has proved uniformly unsuccessful in every case where it has been employed. The fact, therefore, that any particular method has proved efficient in a few cases, is no certain indication of its value. The whole subject is a comparatively recent one, and more experience is necessary before any procedure can be definitely pointed to as the best; indeed, it is doubtful whether all cases admit of precisely the same plan of treatment.

Time will doubtless clear up many points both with regard to temporary results and also with regard to the permanent behaviour of the scar, but I think I am justified in saying, that whereas unaided suture must always remain a safe measure in the hands of the few, the operation which I have described places circular enterorrhaphy within reach of the many, and constitutes a simple, safe, and speedy method of effecting the immediate union of divided gut, and at the same time leaves a scar the after condition of which is likely to be satisfactory.

CASE I.—W. B., aged 18, porter, admitted January 18, 1897, with a strangulated right congenital inguinal hernia.

History.—On January 14, at 11 A.M., whilst at work, he was suddenly seized with acute abdominal pain and vomiting; he did not, however, notice the scrotal swelling until the evening.

Vomiting continued with other signs of complete obstruction.

On admission, his general condition was good, the vomiting had ceased, but he lay curled up in bed complaining of constant pain in the abdomen, which was very tender, rigidly retracted, and motionless. There was no distension.

The right side of the scrotum was immensely swollen, the skin being œdematous and of a dusky purplish hue.

Operation.—On January 18, at 10 P.M., 4 days 11 hours after the onset of symptoms.

An incision through the œdematous scrotal tissues, which were about an inch thick, opened the right tunica vaginalis, let out a quantity of exceedingly foul dark fluid mixed with black clots of blood, and exposed a knuckle of small intestine. This was black and covered with shiny peritoneum for the most part, but at one spot near the mesenteric attachment it was

gangrenous, presenting a mottled appearance, and being so soft that, although handled with all gentleness, it gave way and the intestinal contents escaped.

Resection having been decided upon, the cavity of the tunica vaginalis was thoroughly irrigated and the gangrenous loop of gut wrapped in sublimate gauze. The stricture was then divided and the incision prolonged for about four inches up the right linea semi-lunaris to allow complete command of the parts.

About six inches of gut were removed together with a V-shaped portion of mesentery.

Before starting to unite the two ends, the rubber band which had been passed round the upper portion of intestine was loosened, and a quantity of fluid fæces allowed to escape.

Union was then effected in the manner described above. The abdominal wound was sutured in the ordinary way, a drainage-tube being left in the lower angle.

Patient stood the operation well.

As was to be expected from the conditions of the tissues at the time of the operation, the wound suppurated, but apart from this the patient's convalescence was uninterrupted.

His bowels acted twice on January 19th, and again on the 20th, continuing regular from that date. He was discharged at the end of February wearing an abdominal belt. Since then he has been seen from time to time, and, beyond a slight tendency to hernia in the situation of the scar, is perfectly sound.

CASE II.—H. K., aged 12, schoolgirl. Admitted July 13, 1896, with an obscure swelling in right inguinal region. Pain referred to right sacro-iliac joint; diarrhoea and raised temperature.

August 11, 1896.—Incision along right iliac crest. Hard fibrous mass found, which was fixed to pelvis, and appeared to infiltrate abdominal walls. No pus discovered.

August 13.—Fæcal discharge from wound, which resulted in the formation of an artificial anus.

October 10.—Attempt to close fistula unsuccessful.

November 21.—Abdomen opened in middle line with a view to resection, but owing to adhesions this intention was abandoned. The hole in the intestine was exposed by enlarging the fistula and sewn up, a piece of omentum being grafted on. But this also failed, and the fistula again formed.

On February 16, and again on March 6, 1897, local operations for the closure of the fistula were undertaken, but without success.

The patient now came under my care, and I determined to try resection.

The operation was performed on June 3rd.

The bowel was first packed from the fistula with long strips of cotton bandage, in order to prevent escape of fæces, and also to serve as a guide to the portions of bowel affected. Little difficulty was experienced in freeing the proximal portion, which was apparently the lower end of the ileum, although it was adherent to the omentum and the anterior abdominal wall; but the distal portion, apparently the ascending colon, had to be practically carved out from a mass of dense fibrous tissue with which it was blended, so that the contour of its walls was completely lost.

The preliminary packing and the great thickness of the gut rendered this task easier than it would otherwise have been, but even then it was found impossible to isolate more than a length of one inch with safety.

The portions of intestine with the fistulous opening, some three inches in all, was then excised, and the ends joined in the manner above described. Owing to the great thickness and hardness of the wall of the colon, some difficulty was experienced in getting the circular ligature fixed round this piece.

The greater part of the wound was closed, but the portion corresponding to the site of the fistula was left open; indeed, the condition of the parts, as a result of the previous operations, was such that it would have been impossible to close this, even if it had been thought advisable to do so.

At the bottom of the open portion of the wound, when all was finished, the small intestine just above the point of union could be seen.

The patient recovered from the operation well, and during the night passed flatus per anum once.

June 4.—Sharp attack of pain, referred to wound; signs of obstruction, pulse and respiration very rapid, temperature normal.

June 5.—Dressed in the morning; exposed portion of intestine noticed to be distended. General condition much the same. Vomiting continues.

6.30 P.M., exactly forty-eight hours after operation, dressed again; intestine more distended; suspicion of leakage.

8 P.M.—Patient had a desire to defæcate; enema given and much flatus came away, no fæces.

June 6.—More flatus passed during night. The wound has partially broken down, and fæcal matter is escaping at the old

opening. Symptoms of obstruction relieved. Pulse and respiration still very rapid, but temperature up as high as 100° on one occasion only.

For some days it seemed that the operation, like all the others, was doomed to fail, but on June 12th a very small motion was passed per anum. The bowels were again open on the 14th, and twice on the 15th, after which date the discharge from the fistula, which had been diminishing for some days, ceased altogether, and henceforward normal evacuations occurred daily.

The wound slowly granulated up, and on August 18th she was sent to a convalescent home. This patient has also been kept under observation since the operation, and up to the present has had no further intestinal troubles.

Although the operation was ultimately successful in curing the condition for which it was undertaken, it may seem that the notes of the above case show little in favour of the use of the tube. Still the junction remained water-tight for forty-eight hours, and whatever others might have done by the use of unaided sutures, I feel absolutely certain, bearing in mind the unfavourable nature of the local conditions, that I could have secured this result by no other means. Moreover, I feel that to achieve this would be in nearly every case to achieve immediate success, and that in this instance it was the obstruction which caused the union to break down temporarily, and no fault in the method by which this was effected.

The cause of the obstruction I cannot be sure of, but that it was not of a mechanical nature the passage of flatus shows. And although I know nothing about the condition, I am tempted to hazard the guess that the passage of the intestinal contents was rendered difficult by the contracted and atonic state of the large intestine, which had not been called upon for a long time to execute its functions; for I find, on referring to the previous notes of the case, in which a daily record has been carefully kept, that up to November 21, 1896, the bowels were open fairly regularly; from that date to the end of the year, five times only. During January 1897 three motions are recorded, but from the 13th of that month till the date of the operation, *i.e.*, June 3rd, practically everything passed by the fistula, a little faecal matter being obtained by enemata on three occasions only.

Whether the hypothesis I have advanced be the correct one or not, in a similar case in future I should certainly try to dilate the lower bowel by injections from the fistula before proceeding to operate.

THE SURGICAL TREATMENT OF INCREASED INTRA-CRANIAL PRESSURE.

BY

CHARLES A. MORTON.

PART I.—*The Relief of Pressure in Cerebral Tumour.*

If a cerebral tumour is of large size, and grows from the skull or membranes or surface of the brain, it will certainly compress the brain just as an extra-dural collection of clot does; whereas if it is situated in the interior of the brain, it will not increase the bulk of the brain in exact proportion to its size; for much of the brain tissue will be destroyed by it, and the surrounding cerebral matter probably compressed. It is inconceivable to me that a small growth can increase the bulk of the brain sufficiently to seriously raise the intra-cranial pressure, but it seems likely that a large tumour may do so. The pressure would be almost certainly transmitted through the brain tissue itself, for it has been shown that the cerebro-spinal fluid cannot permanently transmit a local rise of pressure to other parts of the central nervous system, as an increase of pressure causes more rapid absorption of the fluid, at the same time that the transudation of fluid from the capillaries is diminished.¹

There is, however, the record of a case of coma from traumatic extra-dural hæmorrhage, in which evacuation of the cerebro-spinal fluid from the ventricles caused some temporary improvement.²

If, then, the increased pressure is transmitted through the brain tissue, the pressure of the tentorium fixed around the skull would be likely to prevent the transmission of any serious increase of pressure from the other portion of brain which lies

¹ The Physiology and Pathology of the Cerebral Circulation, by Dr. Leona Hill, &c. Paper by Spencer Horsley on Intra-cranial Pressure, in Report Department of Pathology, University College, for 1894.

² Annals of Surgery, 1894, vol. xix. p. 428.

on one side of it to that which lies on the other. But any increase of pressure under the tentorium would probably produce more marked pressure effects than in the general cranial cavity, as the space is so limited and the parts which are compressed are of such vital importance.

But we must remember that there is another condition besides the presence of the actual growth which will cause increase of bulk in the brain, and that is secondary œdema. Even a small growth on the surface of the brain, by compressing the surrounding vessels, may cause œdema in a widespread area.

Mr. W. Spencer and Mr. Victor Horsley have, however, shown that pressure applied to the upper and front part of the brain will force the cerebellum into the foramen magnum in spite of the presence of the tentorium, and hence cause serious pressure on the medulla, which can be removed by trephining the occipital bone and raising the vermiform process of the cerebellum.¹

Let us now turn to the clinical aspect of the question, and compare the symptoms of intra-cranial tumour with those which occur in cases of extra-dural hæmorrhage or depressed bone, or have been observed in experiments in which pressure has been made upon the brain. In cases of compression of the brain, headache is said by some surgical writers to precede the onset of coma, but it is hardly, I think, recognised as a symptom of such a condition. Vomiting does not occur; convulsions are rare; the pulse and respiration are first abnormally slow, later on they become very rapid and irregular; the pupils become widely dilated and immobile to light. Numerous experiments by Astley Cooper, Duret, Franck, Bergmann, and others,² have shown that increased intra-cranial pressure will produce coma, with first slowing, and later marked acceleration of the pulse, and slowing and finally cessation of respiration before the heart stops. Marked slowing of the pulse and Cheyne-Stokes respiration was produced by Bergmann by compressing a sacral meningocele. Several experimenters found that the symptoms of increased intra-cranial pressure were produced only when the cranial contents were increased by 6 to 7 per cent.

In the early stage of cerebral tumour the classical symptoms are headache, vomiting, and optic neuritis, and these are either not present in, or are certainly not marked symptoms of, surgical compression; but we must remember that in tumour the onset of the pressure is not rapid, as it is in surgical compression, and this may be the reason why, in the latter, drowsiness

¹ *Loc. cit.*

² See paper already quoted, by Spencer and Horsley.

and the coma are at once produced. It is, of course, not rare for a case of cerebral tumour to terminate in coma, and then the resemblance to surgical compression is great.

It has always been a much-debated point whether the optic neuritis present with cerebral tumour is due to increased pressure, or to a spreading meningitis or other cause, and Dr. Gowers has pointed out that it may be present with a very small tumour and absent with a very large one.¹ Dr. Gowers has also called attention² to the fact that the headache may be severe when the growth is too small to cause any increase of the intra-cranial pressure, and may be absent when a large tumour is present. He also states that tumours of the membranes, even when of large size and evidently compressing the brain, are less likely to be attended with symptoms than growths in the brain itself. This fact would be evidence against the view that the symptoms are due to increased intra-cranial pressure, for, if they were, it would make very little difference whether the growth was attached to the membranes only or was situated in the cerebral tissue. There is, however, the record³ of one case in which the tumour was intra-cranial but extra-cerebral (it grew from the pituitary body and was of large size), and yet severe headache and vomiting were present, and were cured by an operation which could only have brought about relief by diminishing the intra-cranial pressure.

There is a record⁴ of an experiment which may throw light on the question as to whether headache can be produced by increased pressure, but it is so remarkable that, as I cannot refer to the original papers in which it is described, I merely allude to it. A tumour was trephined over the parietal region of the brain, and on making pressure on the cerebral cortex, interim headache is said to have been produced. Dilatation of pupils and changes in pulse and respiration were also noticed. It seems to me, then, that all we can say is, that an intra-cranial tumour may be so large as to directly increase the pressure within the skull to a considerable degree, or even if not large, it may do so by setting up surrounding oedema, but that the tentorium may be expected to prevent the transmission of serious pressure from the part of the brain situated above it to that portion which lies below, and that although the earlier symptoms of cerebral tumour are not such as to suggest the

¹ See report of discussion on this subject at Ophthalmological Society, *Lancet*, 1894, vol. i. p. 1561.

² *Diseases of the Nervous System*, 1893, vol. i. p. 505.

³ Case of Caton and Paul, *Brit. Med. Journ.*, 1893, vol. ii. p. 1421.

⁴ *Epitome Brit. Med. Journ.*, 1895, vol. ii. No. 363, from *Riv. Sper. di Freniatria*, vol. xxi. fasc. 2-3.

presence of general compression, yet the termination of the case in coma is suggestive of such a condition.

I think the strongest argument in favour of the view that the symptoms of cerebral tumour are due to increased intracranial pressure lies in the benefit received in so many cases by operation, which, so far as we can see, is only brought about through relief of such pressure. In the case which Dr. Clarke and I published¹ two years ago, the relief of headache after the operation was very striking: as the patient expressed it, "he felt as if he had a new head." The optic neuritis in this case also cleared up after the operation. The nature of the operation will be referred to later on, in discussing the method of operating. Professor Victor Horsley has cured the headache and vomiting, and brought about subsidence of the optic neuritis in several cases.² One of these was very remarkable. The patient suffered from rotation fits, in which the whole body rotated round the longitudinal axis towards the left side, and also from attacks of sudden dyspnoea, presumably from pressure on the medulla, and from severe headache and vomiting. The subsidence of symptoms after opening the skull to relieve pressure was very striking. Dr. Caton and Mr. Paul have published³ a very interesting case to which reference has already been made. There was a large tumour of the pituitary body, and the patient suffered from severe headache, which was completely relieved by removal of a large portion of the skull. Dr. Buzzard and Mr. Ballance have recorded⁴ a case in which hemiplegia and intense headache were present and coma supervened, but on opening the skull and incising the dura mater, consciousness returned, the headache was cured, and there was some return of power on the hemiplegic side. The tumour was supposed to be in the internal capsule. Successful cases have also been published⁵ by Kammerer and Wyeth in America, and Allan Starr records⁶ one in which headache was relieved for a few weeks by removal of an area of the skull, but the optic neuritis was not diminished. On the other hand, the operation has been performed, without benefit, in a case recorded by Diller and Buchanan⁷ of tumour of the centrum ovale, in which general and local epileptic attacks were present, and the patient had just recovered from three days' coma when operated on. The amount of bone removed is not stated with exactness, but it was larger than a circle of $1\frac{1}{4}$ inches in diameter. The dura

¹ Brit. Med. Journ., 1895, vol. i. p. 802.

² Ibid., 1890, vol. ii. p. 1290; 1893, vol. ii. p. 1365.

³ Ibid., 1893, vol. ii. p. 1421.

⁵ Annals of Surgery, 1894, vol. xix. p. 685.

⁶ Med. Record, 1896, vol. i. p. 145.

⁴ Ibid., 1895, vol. i. p. 8.

⁷ Ibid., 1895, March 23rd.

mater was opened and sutured, and the wound healed by primary union. No improvement followed the operation. In three cases operated on by Albert¹ there was either no improvement or it was very slight. In a case of large cerebellar tumour in which I operated, there was marked relief of giddiness after removal of a large area of the skull in the parietal region, but the optic neuritis did not improve to any decided extent, and I then removed the dura mater in the same area (3 inches in diameter) and allowed the brain to protrude. An enormous hernia cerebri formed, although the wound healed without any suppuration, and as the hernia increased and involved the motor area, hemiplegic symptoms developed, and the patient became comatose and died. The case is a most important one, as it shows the danger of allowing a cerebral hernia to form for the relief of increased intra-cranial pressure. We must remember that when, from increase of the intra-cranial pressure, the brain protrudes through an opening in the skull, however large that opening may be (and in this case it was 3 inches in diameter), the veins on the surface of the brain will be liable to pressure when the brain passes out under the edge of the skull, and that this venous obstruction may produce somewhat widespread œdema of the brain tissue in the neighbourhood, and thus actually increase the bulk of the brain tissue within the skull to a greater extent than the production of the hernia cerebri will reduce it.

Professor Keen of Philadelphia has published² a case in which a large hernia cerebri formed after trephining and incising the dura mater, in order to try and discover a cerebral tumour. As in my case, the wound was aseptic and healed by primary union. The intense headache and marked delusions, present before the operation, were entirely removed, although the trephining was done over the occipital lobe; some loss of power and of sensation occurred in the arm and leg on the opposite side after the operation, and was associated with pain in, and congestion and œdema of, these limbs. Although the hernia cerebri began to form directly the dura mater was opened, and increased considerably during the few days directly following the operation, and continued to increase, yet he lived for four and a half months.

Dr. James Taylor has recorded³ three cases of cerebral tumour in which optic neuritis either subsided or was materially diminished after merely opening the skull. In two of

¹ Wiener Medicinische Wochensch., 1895, Nos. 1, 2, 3.

² American Journal of Medical Science, 1894, January, p. 39.

³ Lancet, 1894, vol. i. p. 1561.

the cases the tumours were subsequently found on post-mortem examination.

It is very important to decide whether it is necessary to open the dura mater, in order to relieve the intra-cranial pressure, if a large area of bone is removed. In the case of Caton and Paul,¹ and in the case which Dr. Clarke and I published,² the headache, which had been severe before operation, was cured, and yet the dura mater was not opened, and in my second case the giddiness was greatly lessened by a similar operation. Ballance and Beevor, however, urge that it is not enough simply to remove the skull, but that the dura mater should also be opened,³ and they describe an experiment which shows how little increased room within the dura mater is produced by removing even a very large area of the skull. The dura mater is not a sufficiently elastic membrane to allow of much expansion. On the other hand, the risks of producing a large hernia cerebri by opening the dura mater, as shown by my second case, must be taken into serious consideration, and we must remember the benefit which has followed the mere removal of an area of the skull. I should, I think, myself be inclined, at any rate in the first instance, simply to remove a large area of bone. The risk attending this operation would not be great unless the patient's strength had very seriously diminished, when possibly shock might be experienced. There was no shock in the two cases in which I operated. If the benefit hoped for was not realised after the operation, the question of removal of the dura mater in the same area could then be considered.

A case which is of great interest, as showing the marked benefit which can be derived from an operation which does not remove the tumour, but simply diminishes the pressure which it exerts—and more especially as illustrating the relief which may be obtained by merely removing a large area of bone without opening the dura mater—is recorded by Dr. Colman and Mr. Ballance.⁴ A subcortical cystic glioma was present, and the patient suffered from severe headache, optic neuritis, aphasia, and some loss of power and impairment of sensibility in one upper limb, and irregular respiration with occasional cessation of breathing had been present during the night before operation. An area of bone about 3 inches square was removed from one parietal region; the dura mater bulged considerably, but was not opened. For a week great improvement resulted; the headache disappeared, sensation became normal in the limb,

¹ *Loc. cit.*

² *Loc. cit.*

³ *Loc. cit.*

⁴ *Brit. Med. Journ.*, 1896, vol. i. p. 728.

and the comprehension of written words became possible ; but at the end of the week the pain and vomiting returned, and the optic neuritis increased, so that the dura mater was opened and a cyst in a glioma discovered and drained. The optic neuritis, the aphasia, and all other symptoms then subsided, and for many weeks she remained well, but then the drainage of the cyst became imperfect, the symptoms returned, and she died.

In an earlier part of this paper reference was made to the fact that the cerebro-spinal fluid cannot transmit a local increase of pressure to other parts of the brain, but a tumour beneath the tentorium may so compress the veins of Galen as to cause increased exudation of fluid, or may obstruct the outflow of fluid from the ventricles by pressure on the aqueduct of Sylvius. Such distension of the ventricle has been relieved by tapping. A very interesting case, in which the ventricle was first tapped and the cerebellar fossa was subsequently opened, to relieve subtentorial pressure more directly, is recorded by Dr. Gordon of Exeter.¹ Symptoms of cerebral tumour were well marked, and there was reason to suppose the growth was in the cerebellum. Operation was undertaken simply to relieve increased pressure. An inch disc of bone was removed from the region of the right motor area, and the dura mater bulged out considerably ; on incising it, the brain protruded to so great an extent that it was thought advisable to tap the lateral ventricle, and about six drachms of fluid were withdrawn. The brain then bulged less and began to pulsate. No drainage-tube was left in the ventricle, but the flap was united. A hernia cerebri formed under the united flap, and some loss of power and sensibility occurred in the right side, doubtless from involvement of the motor area in the hernia. The headache completely subsided, but the hernia increased so much that it was feared the skin over it might give way, and the patient became almost unconscious. The lateral ventricle was then drained through the hernia, and the drowsiness passed off. So long as drainage was maintained she was not drowsy, but on two occasions when the drainage failed she became drowsy in a marked degree. Finally, a $\frac{3}{4}$ -inch disc of bone was removed from the left side of the cerebellar fossa and the cerebellum allowed to bulge through it beneath the united skin flap. There was then no further recurrence of the drowsiness and the cerebral hernia gradually decreased under pressure. The patient recovered, but was blind from optic neuritis. Mills and Hearn² record a case

¹ *Lancet*, 1897, vol. i. p. 94.

² *Philadelphia Hospital Reports*, vol. i. p. 270.

in which pressure of a tumour on the Sylvian aqueduct caused retention of fluid in the ventricles. The ventricle was tapped and a large amount of fluid withdrawn, with great relief of the intense headache which had been present before operation. In another case, in which a cerebellar tumour pressed on the veins of Galen and caused great distension of the ventricles with fluid, Keen drained the ventricles for forty-five days. Only a temporary decrease of the optic neuritis resulted.¹ The subject of ventricular drainage will be more fully considered in connection with the operative treatment of tuberculous meningitis.

PART II.—*The Relief of Pressure in Tuberculous Meningitis by Drainage of the Lateral Ventricles.*

Marked increase in the amount of intra-ventricular fluid is a common condition in meningitis, and doubtless raises the general intra-cranial pressure considerably. In a paper which I published some years ago,² I entered fully into the question whether the softening, which we so commonly find around the ventricles, was due to the pressure of the fluid on the surrounding brain tissue, and I came to the conclusion that it was probably due to this pressure. The evidence seemed to me against the theories that it was due to thrombosis of the veins of Galen or to soaking of fluid into the brain tissue; and if it were due to extension of inflammation from the membrane into the brain tissue, it ought certainly to be most marked in tuberculous cases, where the meningitis is most extensive—at the base and along the Sylvian fissure—and here it is not present. From my observations on ten cases of meningitis (seven tuberculous and three non-tuberculous), I came to the conclusion that coma was of longer duration in the cases in which the softening around the ventricles was marked. Occasionally we find at the autopsy on a case of tuberculous meningitis no excess of fluid in the ventricles, and no softening around. I have already referred to one such case in a paper published in 1893:³ the child died in convulsions after a week's illness. We must remember that a lesion of the part of the brain which becomes softened—the corpus callosum and the great basal ganglia—would not be likely to cause coma or cardio-respiratory failure. Then, again, the analogy which is sometimes drawn between the benefit derived from laparotomy in tuberculous peritonitis and the effect which we seek to obtain in tuberculous meningitis, will not, I think, hold good; for in the former condition the with-

¹ Medical Record, 1890, vol. ii. p. 317.

² Brit. Med. Journ., 1891, vol. ii. p. 840.

³ Lancet, 1893, vol. ii. p. 194.

drawal of the fluid by incision is supposed to arrest the tuberculosis, whereas in the latter the operation is undertaken simply to reduce increased pressure. There is a much closer analogy between this operation and tapping a large pleural effusion to prevent pressure effects; but whereas in that case we are certain the symptoms are due to pressure, it is doubtful to what extent the symptoms of tuberculous meningitis depend on pressure.

We must also remember that tuberculous meningitis is generally only a part of general tuberculosis. Some surgeons have said that of course the presence of such a condition would contra-indicate operation in tuberculous meningitis, but I would venture to point out that again and again the existence of the generalised tubercle is only discovered on the post-mortem table, and I think we must expect it to be present in nearly all cases of tuberculous meningitis.

The early symptoms of tuberculous meningitis resemble those of cerebral tumour, and we have already seen that headache cannot with certainty be regarded as the result of increased intra-cranial pressure, and that there is no evidence to support the view that vomiting can be thus produced. In the later stage, the coma is very suggestive of increased intra-cranial pressure, especially when we remember it is usually associated with widely dilated pupils. The abnormal slowing of the pulse at one stage of the illness is also to be noted. On the other hand, the unilateral paralysis and spasms sometimes found associated with the coma of the later stage is not to be explained by such general increase of pressure as effusion into the ventricle would produce.

We may now consider the evidence in favour of the operation, from the records of cases in which it has been performed, but, before doing so, it is necessary to describe the methods which have been employed to drain the ventricles. The method which has been perhaps most frequently used has been direct drainage through the side of the brain. Some years ago, when assisting at the operation of trephining for supposed abscess in the tempero-sphenoidal lobe, at a spot a short distance above and behind the meatus, I noticed that when a director was passed through the brain inwards and downwards, clear fluid escaped from the ventricle. I subsequently made two experiments on the dead body to determine where would be a suitable spot for drainage of the ventricles, and remembering the locality in which the fluid was evacuated at the operation, I decided to trephine 2 inches behind the meatus and 2 inches above Reid's base line. On the head of a dead child, aged eight years, a point was taken $1\frac{1}{2}$ inches above Reid's base line and $1\frac{1}{2}$ inches behind

the meatus ($1\frac{1}{2}$ rather than 2 inches, to allow for the smaller head of a child), and a tube passed in from 2 to 3 inches, and very slightly upwards and forwards, when fluid began to flow. On removing the brain, it was found to have entered the ventricle. The second experiment was on the head of a dead baby, two years of age. As the head was so small, a point only $1\frac{1}{2}$ inches behind the centre of the meatus and $1\frac{1}{4}$ inches above Reid's base line was taken, and a tube passed inwards and very slightly upwards and forwards entered the ventricle and very freely drained away fluid, which was in great excess, as the child had died of tuberculous meningitis. As this disease is most common in children, it was thought wise to experiment on the child's head. I have drained the ventricles during life in this way in three cases. These experiments were made in ignorance of similar experiments by Keen of Philadelphia in 1888.¹ He recommends a point $1\frac{1}{4}$ inches behind the meatus and $1\frac{1}{4}$ inches above Reid's base line, and the trochar is directed to a point $2\frac{1}{2}$ inches vertically above the opposite meatus.

In some experiments which I made² to ascertain the condition of the foramen of Magendie in tuberculous meningitis, I gained access to the medulla by removing a portion of the occipital bone, and found the sub-arachnoid space could be easily opened in this situation. Mr. Parkin of Hull,³ after reading my paper, determined to drain the sub-arachnoid space in tuberculous meningitis in this situation, so as to avoid making a track through the brain or removing any bone from the spine, and he and others have operated by trephining the occipital bone close to the foramen magnum. I cannot say that I should feel inclined to adopt this locality myself, because of its proximity to so dangerous a region as the floor of the fourth ventricle, and I do not think any harm is likely to result from leaving a drainage-tube in the cerebral tissue. In one case in which I did so for a fortnight, no bad results followed; and Keen⁴ has allowed a drainage-tube to remain in the brain for forty-five days without exciting any surrounding inflammation.

The ventricles have also been drained indirectly through the sub-arachnoid space of the spinal cord, by performing laminectomy. Several cases have been operated on in this way at the Middlesex Hospital. In order that drainage of the sub-arachnoid space of the cord may also drain the ventricles, it is necessary that the communications between the ventricles and the sub-arachnoid space in the roof of the fourth ventricle

¹ Medical News, 1888, vol. ii. p. 603.

² Brit. Med. Journ., 1893, vol. i. p. 741.

³ Lancet, July 1, 1893.

⁴ Medical Record, 1890, vol. ii. p. 317.

should be patent. In order to ascertain if they were so, I examined the foramen of Magendie by the special dissection to which I have already referred, so as to avoid such disturbance of the parts as removal of the brain would produce, and in all the cases of tuberculous meningitis I found it patent. Hence we may feel sure that spinal drainage will also drain the ventricles, but I do not myself see any advantage in performing laminectomy rather than trephining, though a fine aspirating trochar and cannula might be introduced into the spinal canal between the laminæ of the third and fourth lumbar vertebræ, and allowed to remain there for permanent drainage with an antiseptic dressing, without the necessity of administering an anæsthetic. The spinal canal has been tapped in this way in numerous cases of tuberculous meningitis, chiefly for diagnostic purposes (for in several it has been possible to find tubercle bacilli in the fluid withdrawn), but some slight improvement has followed in some. Gaibissi reports¹ some cases in which headache lessened and the pupils became more active to light. Fürbinger² has tapped the spinal canal in eighty-six cases (thirty-seven of which were tuberculous meningitis and the others non-tuberculous meningitis or cerebral tumour), and he is doubtful as to its therapeutic value. He has seen undoubted reduction of intra-cranial pressure follow (as shown by the sinking of the fontanelle), and yet no alteration in the symptoms. From an experience of fifteen cases of meningitis and cerebral tumour, Lichtheim³ considers that the proceeding is of no therapeutic value, but Fraenkel⁴ has seen improvement after it. Dr. Essex Wynter⁵ has recorded four cases of tuberculous meningitis in which the spinal sub-arachnoid space was drained for some hours or days. They all occurred at the Middlesex Hospital. Three of the patients were already comatose; in one of these (drained by means of a Southey's tube introduced between the laminæ of the lumbar vertebræ) no improvement followed twenty-four hours' drainage; in another (in which laminectomy was performed and a drainage-tube inserted), the only improvement consisted in contraction and activity of previously dilated and inactive pupils, and the child died five hours after the operation; in the third case (an infant), puncture with a Southey's tube had no effect, and the child died a few hours after. In the patient, who was not comatose at the time of the operation, there is no evidence of distinct benefit, though drainage by means of a drainage-tube introduced after lamin-

¹ Gazz. degli Osped., Feb. 22, 1890, and Epit. Brit. Med. Journ., March 28, 1896,

p. 234.

² Berl. Klin. Woch., 1895, No. 13, and Epit. Brit. Med. Journ., April 27, 1895,

No. 320.

³ Ibid.

⁴ Ibid.

⁵ Lancet, 1891, vol. i. p. 981.

ectomy, was maintained for three days; at the end of this time the drainage-tube slipped out, and the child became comatose and died.

Wernicke is said by Keen of Philadelphia¹ to have been the first to trephine the skull and puncture the later ventricle. This was in 1881. Without knowing of this suggestion, Keen himself made the same proposition in 1888. He explored the brain for temporo-sphenoidal abscess, and found post-mortem that the case was one of tuberculous meningitis, and that he had almost, but not quite, tapped the greatly distended ventricles. This induced him to drain the ventricles in a case in which they were distended from the pressure of a cerebellar tumour on the veins of Galen. The case, which has been already referred to in connection with the treatment of cerebral tumours, shows that a drainage-tube may remain in the brain for forty-five days without exciting any surrounding inflammatory softening, and that the ventricles may be safely irrigated with boracic lotion or boiled water. This was not, however, the first case of drainage of the ventricles. Von Bergman had operated on one case in the previous year,² in which coma was present before operation; but after puncture of the ventricle had been made, the pulse and respirations became more regular, and the pupils less dilated and reacted more to light. One of the first, if not the first case operated on in this country, was Mr. Mayo Robson's.³ In this case otorrhœa was present on the left side, with symptoms of meningitis, but it was thought that cerebral abscess might be present, as there was right hemiplegia and aphasia. Mr. Robson trephined, but failing to discover pus, drew off six drachms of fluid from the lateral ventricle, but no drainage-tube was inserted. The patient was considered to have recovered as the result of this, but there was no change in the symptoms until the following day; and it seems to me that the temporary withdrawal of six ounces of fluid could not have had a prolonged effect, as the fluid would be very rapidly re-secreted. The hemiplegia and aphasia passed off. In a case of tuberculous meningitis recorded by Mr. Kendal Franks,⁴ in which he drained the lateral ventricle, improvement seems clearly to have been due to the operation. A child was admitted into Hospital in a semi-comatose condition, with paralysis of the right arm and leg and decided weakness of the muscles of the left side. There was a history of previous otorrhœa on the left side. Temporo-

¹ Medical Record, 1890, vol. ii. p. 317.

² Annals of Surgery, 1894, vol. xix. p. 426.

³ Brit. Med. Journ., 1890, vol. ii. p. 1292.

⁴ Ibid., 1890, p. 1294.

sphenoidal abscess was suspected, but no pus was discovered; but on puncturing the lateral ventricle, cerebro-spinal fluid was evacuated and a drainage-tube inserted into the ventricle. The child began to move the right arm and leg directly after, and consciousness returned very quickly. Before the operation coma was increasing. However, the "pressure symptoms" returned, and death took place four days later.

The only case which can be claimed as one of recovery from tuberculous meningitis after drainage of the ventricles is the one recorded by Ord and Waterhouse;¹ but in this case the child had suffered from headache and vomiting for more than a month before the operation was performed, and then the child was not comatose—a condition unusual in tuberculous meningitis. The patient, a child five years of age, apparently suffered from intense headache, and there was high temperature and optic neuritis. The skull was trephined midway between the external occipital crest and the mastoid process. The dura mater bulged into the trephine opening, and on incision, thirty drops of slightly greenish turbid fluid was evacuated, and the cerebellum bulged out into the trephine opening. A probe was passed by the side of the brain in the direction of the medulla, and some drachms of serous fluid were withdrawn. Drainage was maintained for seventeen days, and much cerebro-spinal fluid escaped. There was no further headache after the operation, but the temperature kept up. The optic neuritis slowly subsided. As the authors point out, the temperature was much in favour of meningitis rather than cerebral tumour. There was no otorrhœa. Although the locality selected for trephining was much the same as in Mr. Parkins' case, Mr. Waterhouse had not seen Mr. Parkins' paper recommending it when he operated. Mr. Parkins' method of operating has been already referred to. He has drained the sub-arachnoid space in four cases of tuberculous meningitis.² Only the first case is published in detail. All the patients were comatose at the time of operation. The pulse and respirations became more regular after drainage was established, but this was the only change of importance, and the child died sixteen hours later. In the other three cases, the patients lived twelve, four, and ten days respectively. In two out of the four cases tuberculous meningitis was found post-mortem, in the other two no post-mortem examination was made.

Mr. D'Arcy Power has also recorded³ several cases of tuber-

¹ *Lancet*, 1894, vol. i. p. 597.

² *Ibid.*, 1893, July 1, and 1895, vol. ii. p. 1167.

³ *International Clinics*, vol. iii. 5th series.

culous meningitis treated by drainage of the cerebro-spinal fluid by trephining the skull. In one, the child was not quite comatose, and after inserting a drainage-tube into the ventricle through the side of the skull, the breathing became regular, the pulse increased in strength, and he had less muscular twitching; but the improvement did not persist, and he died twenty-seven hours after the operation. In the three other patients (all of whom were comatose), the only material change after the operation was a fall of temperature in two, but in one of these the temperature steadily rose again. In two, fluid was evacuated from the sub-arachnoid space of the brain, but in the third none was found. No mention is made of drainage.

A case is published by Dr. James Kerr¹ as one of recovery from tuberculous meningitis after trephining. The symptoms were certainly such as to suggest the presence of tuberculous meningitis; but looking at the fact that some of the symptoms recurred some months after the operation, I think it must be considered doubtful whether a tubercular growth rather than meningitis may not have been present and become quiescent. I do not think there is clear evidence of withdrawal of cerebro-spinal fluid at the time of the operation. On passing a "fine cannula" in the direction of the ventricle, no fluid escaped, probably because it got blocked with brain matter as it was passed in the right direction. Then a drain of silkworm gut was passed towards the base between the brain and membranes, but there is no mention of any escape of fluid. Indeed, the only mention of the escape of fluid is that, when the dressing was changed sixty hours after the operation, clear fluid drained off in small quantity. Headache was greatly relieved after the operation (as it has been after many trephinings in cerebral tumour), but delusions and general convulsions occurred six days after it had been performed, and headache and vomiting occurred some months later.

Another case, regarded as one of recovery from meningitis after drainage of the cerebro-spinal fluid, is recorded by Mr. C. H. Taylor.² On opening the dura mater just above the right lateral sinus, much clear fluid escaped, which seems to have collected in a space between the brain and dura mater. The lateral sinus was wounded and had to be plugged, and cerebro-spinal fluid drained away through the plug for five days. The child had been in a drowsy condition for three weeks before operation, and coma had supervened. The head was retracted, the pupils retracted, and optic neuritis was present. Recovery took place after the operation, but there seems

¹ *Lancet*, 1895, vol. ii. p. 1041.

² *Ibid.*, 1895, vol. i. p. 746.

to have been no improvement for the first five days. Dr. Cantley also states¹ that one of his cases of tuberculous meningitis was operated on with temporary improvement. General tuberculosis was found at the autopsy.

A rather remarkable case is reported by McCosh,² in which drainage of the lateral ventricle seemed to do great good. A patient was suffering from very frequent general convulsions, and either remained in a semi-comatose state or became excited and delirious. The convulsions dated from a severe head injury. The brain at the seat of injury was explored, but nothing abnormal discovered, and the ventricle was drained for forty-eight hours. The cessation of convulsions and return to a normal mental condition was rapid and striking, and when the case was reported almost a year after the operation, the improvement was maintained.

It only remains now to refer to my own three cases of meningitis treated by drainage of the ventricles. The first and third were tuberculous, the second was due to infection from the middle-ear suppuration. The tuberculous cases were not materially benefited, but the course of the other after operation was somewhat remarkable, as, although there was purulent meningitis over the base and one hemisphere, the child lived for a fortnight after drainage was commenced, and never became comatose, but died from simple prostration. The temperature also fell to normal for some days before death. In the first two cases operation was not undertaken with a view to draining the ventricles, but as an exploration for cerebral abscess, as were so many of the other recorded cases. As the skull had been opened, it seemed to me desirable to give the patient any chance which drainage of the ventricle might afford. In the third case I was inclined to form a diagnosis of meningitis, and felt that we ought to give the child any chance of recovery which seemed possible from drainage of the ventricles.

CASE I.—*Tuberculous Meningitis—Drainage of the Lateral Ventricles.*

E. S., aged 3, was seen by me, in consultation with Dr. Elliott, at the Children's Hospital on June 6, 1896, with a view to exploration of the brain for cerebral abscess. The symptoms were more suggestive of tuberculous meningitis, but it was decided to explore the brain for abscess, and if none was dis-

¹ Brit. Med. Journ., 1895, vol. ii. p. 715.

² American Journal of Medical Science, 1894, vol. cvii. p. 239.

covered, to give the patient the chance of benefit from drainage of the ventricles. The child had been admitted on June 1st, with the history of a week's illness, which began with vomiting. Drowsiness soon set in, and has increased since admission to almost complete coma. There seemed to be some paralysis of the left arm and leg. The pupils were both widely dilated and inactive to light (no mydriator had been used). There was no squint. It was doubtful whether optic neuritis was not just starting in one eye; the outline of the disc was seen to be blurred by both methods of examination, but there was no exudation around the vessels. There was a history of double otorrhœa some weeks previously, and a little granulation tissue was discovered in the right meatus, but the otorrhœa had not persisted. There was no swelling or tenderness in the course of either jugular vein. There were no physical signs of tubercle in the lungs. The pulse was 150-160, and regular.

At 7 P.M., the head having been shaved, scrubbed, and carbolised, a small flap was turned down, and the skull opened with a half-inch trephine an inch behind the centre of the meatus (in Reid's base-line), and $1\frac{1}{2}$ inches above. This measurement was a reduction of Berningham's— $1\frac{1}{4}$ inch behind meatus and 2 inches above, so as to avoid unusually high sinus—in proportion to the small size of the child's head. The dura mater having been carefully opened, I passed a fine aspirating trochar and cannula inwards and forwards for 2 to 3 inches, and on slowly withdrawing the cannula after removal of the trochar, no fluid escaped. I then passed it more forwards, and clear fluid escaped, and finally pushed it inwards and slightly backwards and downwards, so as to tap the lateral ventricle at a lower level, and drew off more clear fluid. I then endeavoured to pass a fine india-rubber drainage-tube along the side of the fine cannula, but it curled up. It passed easily when threaded on the trochar. The end was brought out through a hole in the centre of the flap, and secured with a minute safety-pin. Only one drachm of chloroform was needed, and there was no shock from the operation. Both pupils were less dilated at the close of the operation, but still inactive to light. There was no movement in the left arm or leg. Dr. Elliott, who watched the pulse during the operation, found a sudden drop to 72 when the fluid was evacuated, but it was 150 to 160 at the end of the operation.

On the following morning (June 7th) her condition was unchanged, except that there was more difficulty in swallowing, and her temperature had risen to 103° . There had been no escape of cerebro-spinal fluid into the dressing, and I found the

tube blocked with cerebral tissue. A large one was introduced, and nearly an ounce of fluid escaped, but no improvement followed. When seen at 9.30 P.M., drainage was found to be still imperfect, but by altering the length of the tube more fluid flowed away. It was a question whether there was not a little return of consciousness. Temperature had on June 8 fallen to 101° ; the dressings were again found dry, but on raising the back of the head a large amount of fluid escaped. This was the only alteration of position which caused fluid to flow. After this she looked about her and moved her left arm more, but she died in the evening.

Post-mortem, June 9th.—The wound was healing without suppuration. There was no fluid in the ventricles or sub-arachnoid space. The ventricles were dilated, and the septum and fornix softened, the septum having been apparently perforated by the drainage-tube, which had entered the ventricle through the corpus striatum, emerging into the ventricle about the middle of its inter-ventricular aspect. There was no explanation as to why sometimes pushing the tube in it, and at other times withdrawing it, caused fluid to flow. There was no softening around the ventricles. On the left posterior aspect of the vortex (well behind the motor area) was a patch of miliary tubercles, and many were found along the Sylvian fissures. The inter-peduncular space was filled with lymph. There was no vertex meningitis, even in the neighbourhood of the drainage-tube. The lungs were full of miliary tubercles, and they were found in smaller number in other organs.

CASE II.—*General Purulent Meningitis Secondary to Otitis Media—Drainage of the Ventricles.*

P. T., aged 4 years, was admitted to the British Children's Hospital, under the care of Dr. Lees, on January 5, 1897, with a history of sudden onset of illness on January 4, with vomiting; but this symptom did not persist after the 6th. He became, however, drowsy and irritable when roused, and the temperature ranged between 101° and 104° . Squint was present, but had been noticed for months, and was probably hypermyopic. There was no paresis in any limb. I saw the boy in consultation with Dr. Lees, with a view to surgical interference, on January the 12th. The pupils were then dilated with atropine. No neuritis existed. Pulse was 110–120 and regular, and respiration 26. The temperature on the previous evening had been 104° . There was no evidence of tubercle in the lungs, and no history or signs of otorrhœa. Although the temperature was

very high for tubercular meningitis, we thought the boy must be suffering from this disease, and the question of drainage of the ventricles was discussed; but we neither of us felt there was sufficient evidence in its value to recommend its adoption.

On January 17, discharge from the right ear was noticed for the first time, and on the 18th this persisted. He lay in the same drowsy condition; took no notice of his surroundings unless roused, and then shrieked. He could speak, but rarely did so. The pupils were widely dilated and inactive to light, though atropine had not been used for more than a week. No tubercles could be discovered in the choroid, and no optic neuritis. Both ears were examined; no perforation in the tympanic membrane was seen in either, but the vena of the membrane was not very clear. There was only pus in the right meatus. The temperature continued at the same level. The average pulse since admission had been 110-120, and the respiration 20-30. On the 18th, when I examined the boy, he was too restless to count the pulse. No paralysis had developed. The onset of otorrhœa and the persistently high temperature suggested the presence of some complication of middle-ear disease. There was no tenderness or swelling along the jugular vein. At another consultation with Dr. Lees it was decided to operate, and I did so at noon on the 18th by Dean's method of exploration of the sinus, temporo-sphenoidal lobe, and cerebellum, by the same trephine opening. The operation was performed on the side of the otorrhœa, *i.e.*, the right side. A half-inch trephine was applied one inch behind the meatus and a quarter of an inch above. There was a reduction of the measurement for an adult of an inch and a half behind and three-quarters above, which I think better than Deans, as it reaches the transverse part of the sinus more easily, and is farther behind that very awkward projecting ridge formed by the junction of the superior border of the petrus portion of the temporal bone and the parietal. From this opening, by cutting away the margin in an upward direction with Hoffman's forceps, I was able to explore the lateral sinus, the cerebellum, and the temporo-sphenoidal lobe. Nothing abnormal was discovered. Punctures into the temporo-sphenoidal lobe withdrew fluid from the ventricle as a drain. Shock from the operation was not marked. Chloroform was administered. The pulse at the end of the operation was said to be 70 to 80, and not very good.

After recovery from the anæsthesia the child was restless and crying, but was quieted by a hypodermic injection of $1/12$ grain of morphine. There was no vomiting.

The day after the operation (January 19), the condition of the child was much what it had been before operation, and there was no great amount of cerebro-spinal fluid draining away. The wound healed by primary union. On January 21, the right meatus was found full of pus. On the 23rd, as so little fluid was draining away, I passed a longer cannula on a blunt guide into the ventricle, and an ounce and a half of fluid drained away at once. After the insertion of this cannula the dressings were found soaked with cerebro-spinal fluid daily. She seemed more sensible and less irritable than before operation, and the pupils became more contracted and reacted slightly to light. The temperature gradually fell after operation. The otorrhœa on the right side did not persist, and none was ever noticed on the left. No optic neuritis developed. Coma did not set in, but the child became very weak, and died from exhaustion on February 2, a fortnight after the operation.

Post-mortem examination showed meningitis of the base and left hemisphere, but not over the right side of the brain. The inter-peduncular space was filled with lymph, which extended along the course of the vessels in the left Sylvian fissure and over the vertex on the left side. The arachnoid all over the left hemisphere was opaque, and turbid serum lay underneath it between the convolutions; but the exudation had only spread a short distance into the right Sylvian fissure, and there was no vertex meningitis on that side. No tubercles could be discovered. The right middle ear contained only a little iodoform, and there was no pus in the mastoid antrum on that side, but the left middle ear and antrum were full of pus, though there had been no discharge from that ear. There was no extradural suppuration, and no abscess in the brain, and the brain tissue was firm, and appeared to be normal. Both lateral ventricles were empty and dilated, but the one which had been drained was more dilated than the left. There was lymph in the choroid plexuses in the lateral ventricles. The third and fourth ventricles were slightly dilated, but the choroid plexus of the fourth ventricle was quite normal. The drainage cannula had entered the cranial cavity one inch behind the meatus and one inch above Reid's base line, and had passed through the posterior part of the middle temporo-sphenoidal convolution into the right lateral ventricle, just where the middle and posterior cornua join the ventricle. At the spot where the cannula had entered the brain it was adherent to the skull. There was no trace of suppuration about the wound.

The decidedly lower range of temperature during the last week of life and the absence of coma are to be noted in con-

nection with the drainage of the ventricles. The absence of meningitis over the right temporo-sphenoidal lobe seems almost to exclude the possibility that the middle ear suppuration on that side was the cause of the meningitis. Was the collection of pus in the left middle ear and mastoid antrum the origin of the disease? The meningitis was not more intense in the neighbourhood of the middle ear and mastoid on that side than elsewhere; indeed, it seemed most intense in the inter-peduncular space. The absence of any naked-eye appearance of tubercles of course goes for very little as proof of the non-tuberculous nature of the disease; but the presence of so marked a vertex meningitis on the left side seems rather strong evidence against its tuberculous nature, and the fact that the meningitis was limited to that side of the vertex favours the view that the suppuration in the middle ear on that side was the cause. In fact, it is difficult to explain the complete absence of meningitis over the right hemisphere except by the supposition that the meningitis started on the left side and spread to the inter-peduncular space, and had not reached the right side of the vertex, though it had begun to creep into the right Sylvian fissure. Meningitis pursuing such a course could hardly have been due to any other cause than the suppuration in the left middle ear.

CASE III.—*Tuberculous Meningitis—Drainage of the Ventricles.*

W. P., aged 5 years, had been in the Children's Hospital for several months suffering from tuberculous disease of the knee-joint, and had twice had serous fluid removed from one pleural cavity. She began to vomit on June 16th, and the vomiting (of cerebral type) continued. On the 19th she had general convulsions, followed by rigidity of the limbs on the left side. After the drowsiness set in, her pulse became rapid and very irregular. The temperature varied from 99° in the morning to 100° to 101° at night, usually 100°. Otorrhœa was first noticed on the right side on the 16th. The left pupil was a little smaller than the right, but both acted to light. There was no squint, but on the night of the 27th there was twitching on right side of face. By the 28th she was almost completely unconscious, and no movement was observed in the left arm. Seeing that otorrhœa on the right side was present, the possibility that cerebral abscess existed suggested itself, but the association of the symptoms with the other manifestations of disease inclined me to think the child was suffering from tuberculous meningitis.

I decided to explore for abscess, and failing to find one, to drain the lateral ventricle. When the scalp was being prepared for operation the child was roused a little and spoke once or twice, and a little chloroform had to be administered for the operation. I explored the tempero-sphenoidal lobe and the lateral lobe of the cerebellum in exactly the same way as in the last case, and failing to find pus, passed a cannula into the lateral ventricle, and withdrew about an ounce of clear cerebro-spinal fluid. There was no change in her condition after the operation for three and a half hours (with the exception of some slight twitching on the left side of the face), but three and a half hours after the operation severe general convulsions set in, her temperature ran up to 106°, and she died.

At the post-mortem examination the cannula was found to have passed through the posterior end of the superior tempero-sphenoidal convolution and middle horn into the ventricle. The ventricles were dry, but there was much fluid in the sub-arachnoid spaces between the convolutions. The parts in the inter-peduncular space were matted together, and the cerebral tissue bounding it was covered with hæmorrhages into the pia mater. This hæmorrhagic effusion extended up the Sylvian fissures for some little distance. There was no soft lymph, but several tubercles were seen. It seems to me that the condition of hæmorrhage from the small vessels of the pia mater was due to bruising of the base of the brain during the violent shaking of the convulsions, in the absence of the cerebro-spinal fluid, which had been drained away. Miliary tubercles were found in the lungs.

I am afraid a study of the records of all these cases does not lead to a hopeful view as to the utility of the operation. The case of Ord and Waterhouse is the most encouraging, but the diagnosis cannot be considered certain. In Mr. Mayo Robson's I cannot see any reasonable connection between the operation and the child's recovery. In Mr. Kendal Frank's case improvement was more distinct after operation than in any of the other recorded cases of undoubted tuberculous meningitis, but it was only temporary. Mr. Parkins' and Mr. D'Arcy Power's cases are all discouraging, and the temporary improvement, when present, was slight, and they all died. The diagnosis of Dr. Kerr's case seems to me very doubtful, and the position of the fluid in Mr. Taylor's case very remarkable for one of general meningitis. The pathology of Dr. M'Cosh's case is of course a matter of great uncertainty. Perhaps my own second case is somewhat encouraging, when we remember the usually

rapid and fatal termination of general purulent meningitis in coma. The cases of drainage by means of the sub-arachnoid space of the cord are rather less encouraging than those in which the skull has been trephined. It has been suggested that if we could operate earlier—before coma set in—we might save some patients. But it seems to me that, with the exception of slowing of the pulse, it is only the onset of drowsiness and coma with widely dilated pupils which suggests increase of intra-cranial pressure, and therefore the need of operation. Moreover, in Mr. Kendal Frank's case, and in one of Mr. Power's, the child was not quite unconscious when the operation was performed. I think the operation is still in an experimental stage, and remembering the remarkable case of Ord and Waterhouse, and the temporary improvement in Kendal Frank's case, and the slight improvement in a few others, we cannot say that it has been proved of no value; but we cannot recommend it except as an experimental operation, with only a small amount of pathological evidence in its favour, and very little clinical evidence to encourage us in its further trial; and we must always remember that tuberculous meningitis is in the great majority of cases only a part of general tuberculosis. However, the operation is without danger *per se*, and the condition for which it is undertaken almost certainly fatal without operation.

A
CASE OF ENTERIC FEVER

FOLLOWED BY ACUTE CYSTITIS DUE TO
BACILLUS COLI COMMUNIS.

BY

THOMAS J. HORDER.

Albert S——, aged 22, engineer, was admitted to "Luke" on October 19, 1897, on account of hoarseness and general weakness.

History.—He was quite well on October 9. On October 10 he complained of bad headache, which lasted until October 13, and then passed off; but on this day he felt "very queer" and had a "shivering fit." He had stayed home from work since October 9, but now returned. On October 15, however, he had a second shivering fit, the headache returned, and he had to take to his bed, where he has been since. On October 15 and 16 there was profuse diarrhoea; cough and hoarseness also came on. On the night of October 16 he vomited, and this happened thrice on October 17th. During the nights of October 16, 17, and 18 his nose bled freely. He was brought to the Hospital on the night of October 19 and admitted.

On admission, the temperature was 104°, and the patient obviously very ill. The face was flushed and the expression anxious. Skin dry. Tongue dry, and covered by a brown fur. Pulse 90, regular, full, but markedly dicrotous. The abdomen was full; the spleen not felt. No rose spots. In the lungs there were much rhonchus and sibilus, and the voice was very hoarse. Heart natural. Fauces natural. Much gurgling on palpating right iliac fossa. Bowels open shortly after admission, the stool appearing natural. Patient vomited once during the night. Urine: sp. gr. 1030, acid, a cloud of albumin.

Progress.—October 22.—Spots noticed to-day; quite characteristic. Spleen not felt. Has been very hoarse and bronchitic. Vomiting has ceased. Patient is deaf, but not severely so. He is very querulous and helpless, lying with his mouth wide open, so as to increase the dryness of mouth and tongue. Coughs frequently. Bowels open nine times in the day. Takes well and sleeps fairly.

October 26.—The temperature has remained high (see chart), and resists the ordinary hydro-therapeutic measures. Pulse 120, soft and dicrotous. Has not been delirious. Urine still albuminous, but contains no sediment. Diarrhœa persists.

October 27.—Worse; last night face became dusky and pulse more feeble. Temperature 104.6° . Quinine given in *iv.* gr. doses for eight doses, with apparently good effects. Delirium present last night has now passed off. Sweats freely at night.

October 30.—Has improved; sweats a good deal. Fresh crops of rose spots. Spleen still not felt. The diarrhœa has been controlled by opium enemata. Temperature not above 104° .

November 15.—Since last note, steady improvement. Diarrhœa replaced by constipation, which is now the only trouble, giving rise to abdominal pain at times. Temperature normal for past week.

November 20.—To-day the temperature rose to 104° in twelve hours, unaccompanied by any rigor. The urine contained pus in visible amount, about one-seventh albumin on boiling; was acid in reaction and of natural odour. It contained no blood nor casts. For the past two days there has been some difficulty with micturition, hardly amounting to retention which needed the catheter. No physical signs of disease in chest or abdomen.

November 21.—Has complained of pain in right loin. Did not sweat last night, as is usual. Urine contains about two inches of pus on standing in specimen glass; reaction still acid; amount natural; frequency of micturition not increased. Some scalding during the act.

November 23.—Temperature normal again; pyuria still present, and burning pain during micturition, which has become more frequent.

November 25, 28, 30, and December 2.—On these dates the temperature rose again to 102° – 103° , falling rapidly to normal. On December 4 it became normal again, and remained so throughout remainder of stay in Hospital. The pus gradually disappeared from the urine, and was quite absent, even on microscopic examination, on December 18. Patient was discharged, without any further complication having arisen, on December 26.

Examination of pus from urine.—On the first appearance of the pyuria, films were prepared from the sediment in the urine and stained with methylene blue. Enormous numbers of some bacillus, seen in fresh specimens to be extremely motile, were found grouped together, and having the morphological characters of the typhoid bacillus. There was complete absence of the ordinary cocci of suppuration. Dr. Klein kindly examined the slides, and my thanks are due to him for the further bacteriological examination of the organism found. These further steps, and the results of them, were as follows:—

(i.) A portion of the sediment from the urine was rubbed over the surface of a phenol-gelatine plate.

(ii.) Another portion was put into phenol-broth, incubated for twenty-four hours at 37° C., and a surface phenol-gelatine plate made from it.

In both cases both plates gave pure cultures of *Bacillus coli communis*. Many of the smaller colonies were examined separately, in view of the possibility of their being typhoid in nature; but all proved to be *B. coli*. The subcultures gave all the reactions of this last-named bacillus, *e.g.*, uniform turbidity of broth and indol after five days; gas bubbles in gelatine shake-culture; acidity and clotting of litmus-milk in usual time; and lastly, on proper staining, a maximum flagella-average of three.

The pathogenicity of the bacillus was not tested.

What may perhaps now be regarded as a further test was made by applying Widal's reaction to the bacillus. An emulsion of the bacilli mixed with a drop of the patient's blood, diluted twenty times, showed no clumping, and only slight impairment of motility; in other words, Widal's test with the bacilli was negative.

Comment.—By the above bacteriological investigations it was proved that the bacilli present in the pus of the urine were *B. coli communis* only, and these existed in pure culture. The acute onset of a cystitis during the second week of convalescence from typhoid fever was of itself a point of some interest, and the additional fact that the cystitis was caused by the *B. coli* seemed to render the case of sufficient importance for being put on record. The observation that the *B. coli* did not "clump" with typhoid serum properly diluted seems to accord with that of most competent authorities.

I am indebted to Dr. Gee for permission to publish the above case.

A CASE OF
CHRONIC STREPTOCOCCUS PYÆMIA,
IN WHICH THE SERUM TREATMENT
PRODUCED NO BENEFIT.

BY

THOMAS J. HORDER.

Thomas B——, aged eight weeks, was admitted to "Hope" on November 8, 1897.

He was born in Whitechapel Infirmary, and was a healthy child until he was vaccinated, when eleven days old. Three days after the operation the left arm became swollen, and the swelling spread downwards to the hand. From this time onwards the infant has never been free from some sort of trouble with its skin. The swelling never seemed to clear up completely, but when the child was four weeks old the right hand and arm also became swollen, the skin being tight and shiny. A week later the child was brought to the out-patient department for treatment.

The condition found at that time suggested cellulitis and the swellings were fomented. They disappeared under this treatment, but soon appeared on both legs and feet; these did not respond to similar treatment, but the swellings increased and the lower part of the trunk also became affected.

On admission, the child seemed to be fairly well nourished, was not peevish or ill-looking, and suckled naturally. The two lower central incisor teeth had appeared through the gum. The vaccination marks appeared to be quite healthy. The temperature was 99.2°, there was no cough, and there were no signs of disease in heart or lungs. No viscus could be felt on palpating the abdomen, perhaps on account of the tenseness of the integuments.

Both legs and feet, both hands, the loins and abdominal walls, were indurated, tense, and swollen. The dorsum of each foot

and each hand pitted slightly on pressure, but no fluctuation could be anywhere obtained. The skin was yellowish-white in colour,—nowhere red,—and could not be pinched up in the fingers. The cheeks were also slightly indurated. The scrotum was neither indurated nor swollen, but the glans penis was much swollen, producing a condition of paraphimosis. The urine was passed in natural amount, but was not tested. There was slight diarrhœa.

The appearances suggested that the case was one of those classed under the term "Scleroderma," but the sequel proved this not to be so.

Three days after admission the indurations seemed to clear in loins and abdominal walls, and those in the legs became centred around the fronts of the tibiæ, where, later, the tissues became more brawny, the skin remaining tense and shining. The condition in hands and arms disappeared entirely. The temperature rose to 101° or above each evening, and fell to normal each morning.

Six days after admission the only abnormal condition consisted of a soft, fluctuating, pointing swelling on the front of each tibia, presenting all the appearances of a large chronic abscess. There was no tenderness nor redness.

Seven days after admission a small localised abscess, red and painful, was discovered over the right olecranon. This yielded to aspiration by a sterilised syringe about a drachm of thick pus, which gave a practically pure culture of streptococcus, sufficiently virulent to kill a mouse in seventeen hours.

On the ninth day the two abscesses on the legs were opened, each containing about two fluid ounces of pus, thin and watery. No bare bone could be found. The olecranon abscess was also subcutaneous,—not communicating with the joint.

On the tenth day the right hand and forearm again became indurated, tense, and swollen, and next day a similar condition involved the left wrist and palm of left hand. A small pointing abscess was opened over the right internal condyle of the humerus.

On the thirteenth day pus was let out from right forearm above the wrist, and also from the right palm. The following day the left arm was similarly dealt with.

On the seventeenth day two small abscesses were opened over the præcordium, and suppuration was still proceeding in right hand. There was no evidence of visceral abscess formation. Cough and signs of bronchitis developed at this time. The diarrhœa persisted throughout.

On the twenty-third day the child was found dead by the

side of its mother in bed, some ten minutes after its wounds had been dressed. There was no evidence that it had been overlaid.

Treatment.—Up till the tenth day the child was taking cod-liver oil and a mixture of quinine sulphate gr. $\frac{1}{4}$ with syrup of iodide of iron ℞. thrice daily. Anti-streptococcus serum (B.I.P.M.) was then injected into the loins subcutaneously in 10 c.c. doses, two doses on tenth day, two on eleventh, one on the twelfth, thirteenth, and fourteenth days: 70 c.c. were thus injected in all. This was then abandoned, the treatment being confined to gr. $\frac{1}{2}$ doses of quinine thrice daily and sanitas baths twice daily.

Autopsy.—This taught us nothing we did not already know. No visceral abscesses were found, and the abscesses over the right olecranon did not communicate with the elbow-joint.

Comment.—This case seemed to merit publication, (i.) because of the unusual appearances which preceded the actual suppuration; but chiefly (ii.) because, although there was clear proof that the infection was due entirely to the streptococcus pyogenes, active treatment with serum produced no good effect, either upon the temperature or upon the abscess formation. So many cases have been reported where the serum was supposed to have produced good results but where the evidence of the true pathological nature of the infection was wanting, that this case appeared worthy of record because the pathological evidence was complete.

I am indebted to Dr. Gee for permission to publish the above case.

SOME POINTS OF INTEREST IN THE MAIDSTONE EPIDEMIC.

BY

W. E. LEE, M.D.

It seemed to me, on returning from Maidstone, that there were so many peculiarities in the present epidemic, that readers of the St. Bartholomew Reports might be interested to hear of them while the outbreak is as yet not quite over.

The epidemic is the largest of modern times in England, and had its own distinguishing features, both clinical and pathological, unlike ordinary sporadic cases of typhoid fever, and unlike those of other epidemics.

The most impressive characteristic was the terribly sudden onset and very acute course of the early cases. This caused the greatest difficulty in diagnosis, as the very suddenness of the onset in so many cases occurring together put the idea of typhoid fever out of court in favour of some other fever, until the definite signs of typhoid fever had had time to appear.

Rich and poor were affected together, the special incidence being on girls of fourteen to twenty-four, of whom an enormous number had typhoid fever. This may partly be explained on the ground that women are more regular water-drinkers than men.

For convenience, the various and varying particulars may be considered under the headings Origin, Clinical Course, Complications, and Pathology.

ORIGIN.

The origin of the outbreak has practically been shown to be the infection of the Farleigh water supply, though the water is still *sub judice*. The town water supply comes from three sources—(A) on the western side, from springs at Farleigh and Tullsham; (B and C) on the eastern side, from deep springs in the chalk at Boarley and at Cossington.

It is supposed, though not definitely proved, that the spring at Tulsham was infected from a hop-pickers' encampment. No case of typhoid fever was known to have occurred among the hop-pickers, but many of diarrhœa.

Cutting off the Tulsham water did not put an end to the epidemic, but cutting off the whole Farleigh water diminished the cases enormously.

The area supplied by Boarley and Cossington forms nearly a square, surrounded on three sides by streets supplied by Farleigh water. It may be interesting to show the comparative incidence on drinkers of the two different water supplies.

On October 1st.—Total notifications, 509—

Dwellers in Farleigh area	474 cases.
Dwellers in Boarley area	35 „

On October 15th.—Total notifications, 1654—

Dwellers in Farleigh area	1566 cases.
Dwellers in Boarley area	88 „

By kind permission of Dr. Hoare, Physician to the West Kent General Hospital, I reproduce the experiences of a terrace of six houses on the Farleigh supply, and of the gaol.

These six houses form an epitome of the epidemic. They were supplied in part by the water from Farleigh and in part by wells of their own. No case of typhoid fever occurred in any house using well-water only.

- No. 1. Eight persons in house, drank well-water only ; no cases.
- „ 2. Ten persons in house, drank well-water only ; no cases.
- „ 3. Eleven persons in house, drank well-water until August 20th, when it was supposed to taste of carbolic. Company's water was then used ; six cases, two severe.
- „ 4. Ten persons in house, drank Company's water ; four cases.
- „ 5. Empty house.
- „ 6. Seven persons in house, drank Company's water ; three very severe cases.

The Gaol.

No case occurred in the gaol, which is supplied by Boarley and Cossington water. On two sides the prison is surrounded by streets in the Boarley and Cossington area, and in them there were sporadic cases of typhoid fever in September, October, and November. On the other two sides are streets in the Farleigh area, and in them the number of cases was

enormous. In one street there were cases in every house but one, where all the inhabitants were over forty years of age.

The immunity of the gaol seems to me of great importance, as it is the only place in the town where the inhabitants can or could be prevented from drinking from any other water supply except their own, as they cannot go out of their own area to obtain it.

No case of enteric fever occurred among the warders, attendants, or prisoners, though four cases, two severe and two mild, occurred in the families of warders living in the infected area.

It may be of interest to quote a case in which a boy who lived in the Boarley area and had a severe attack of typhoid fever could be proved to have drunk Farleigh water.

R. M., æt. 15, got hot on September 3rd and 4th playing football, and drank copiously of his school water, which comes from the Farleigh supply. On September 28th he had a temperature of 104° , much headache, an enlarged and tender spleen, and rose spots.

He had been "feverish" for some days, and had had headache, backache, and abdominal pain.

This boy had an urticarial rash as well as rose spots, which appeared on September 27th and lasted for five days.

The experiences of the gaol, of the terrace mentioned, and the case quoted, will, I think, show that the water supply was the cause of the epidemic.

On the other hand, many people who did not get enteric fever drank Farleigh water unboiled regularly until the outbreak, at the same time as infected members of their households did.

Their immunity was not entirely due to age or previous attacks, as some cases occurred in quite old people, one a lady of seventy-three, and some cases occurred in people who had undoubtedly had typhoid fever some years before.

The Relationship of Diarrhœa and Typhoid Fever.

In August there was an epidemic of severe diarrhœa in the town, and it was noticed that in households drinking Farleigh water those members who had severe diarrhœa in August did not have typhoid fever in September, and those who had no diarrhœa had enteric fever severely.

The following is a case in point:—

In a family of four people, two male and two female, all under thirty-three, the two males and one of the ladies had

excessive diarrhœa in August; the second lady had no diarrhœa. In September and October she complained of malaise and headache, but had no rise of temperature; the malaise decreased, and no further signs appeared until the second week in October, when she was suddenly taken severely ill, and died in four days from perforation and peritonitis. She probably had a mild and ambulatory form of typhoid for some weeks before becoming acutely ill.

COURSE OF THE DISEASE.

The early cases were very grave, with an acute onset, giving rise to a diagnosis of influenza for some days.

So sudden was the onset, that a temperature of 104° was sometimes present on the first day. That it was the first day there seemed, after careful investigation, to be no reasonable doubt.

In one case the actual onset was accompanied by rigor and vomiting, the patient having expressed herself as quite well on the previous day and played tennis. The initial head symptoms were very severe, intense headache, unrelieved by drugs, being the commonest; delirium, and even mania, were fairly frequent in the first twenty-four or forty-eight hours.

The maniacal condition in the first week was most extraordinary; furious, uncontrollable, and taking four or five attendants to prevent the patients (frequently young girls) from getting out of bed. Strapping with padded straps was most useful, as it often seemed to quiet the mental condition. Drugs were quite useless, morphia, hyoscine, chloral, bromides, &c., having either no effect at all, or an exceedingly temporary one. After recovery there was complete forgetfulness of the maniacal period. In a girl of twenty-eight a curious post-epileptoid condition followed the mania, in which there was a tonic contraction of the limbs, stiffness of the head, with the arms adducted, the forearms flexed and the hands clenched; this lasted until twenty-four hours before death from hæmorrhage about a fortnight later.

The temperature, having once risen, was in severe cases steadily maintained above the 104° level, sponging bringing it down for a short time only. Cold sponging was in many instances followed by a rise of temperature, when hot sponging frequently had the desired effect.

Prolonged attacks were common among the early cases—six, seven, and eight weeks' fever being frequently observed, fresh crops of spots continuing to come out during the whole pyrexial

period. Fresh crops of spots are still present in some of the cases, together with a high temperature, after eight weeks' continuous fever.

Prolonged attacks were more common among the severe than the mild cases, though not confined to them.

In children under ten years old a prolonged attack was not uncommonly mild. The temperature would rise to the 100° – 101° level, stop there for two to three days, and then never rise above 100° and never fall below 98.8° for a month or five weeks. During the whole of this time fresh crops of spots came out, the tongue was always furred, and the spleen could be felt in two cases; so in other and similar cases which were less definite. I treated them as active cases of typhoid fever until the temperature became steady at the 98° – 99° level, after which the tongue, although apparently only slightly furred, did definitely become clean, and the children put on flesh.

The Tongue.

In the majority of instances an early fur was observed either centrally on the dorsum or in two bands, the remainder being brightly red and either glazed or not. In later stages the usual dry brown cracked condition supervened.

The condition of this organ was not always quite so typical; two or three very bad cases never had a dirty tongue during eight weeks of fever, and some very mild cases could only be diagnosed by the condition of their tongues, as no other signs were present until the appearance of rose spots, or even for fourteen to sixteen days.

Typhoid Rashes.

These were extraordinarily interesting in their diversity, their appearance, and their combinations. The chief varieties were:—

Rose rash.	Erythemata circinale.
Papular rash.	„ iridial.
Pustular rash.	Morbilliform rashes.
Hæmorrhagic rash.	Rubelliform „
Erythemata.	Scarlatiniform „
„ patchy.	Urticarial „
„ diffuse.	

The ordinary rose rash occurred in practically all cases, the spots being few in the early cases, more numerous in the later ones.

In cases with an acute onset, so that the duration of the fever could be accurately determined, they appeared first on the seventh day. In relapses the rash was usually profuse; in continued fevers lasting from six to eight weeks, if the patient's general condition was improving and the range of temperature getting lower, the later crops of spots were more profuse than the early ones. Their distribution was usually over the abdomen, thorax, and back; in profuse crops they often appeared on the upper limbs, especially on the backs of the hands and wrists; they were much less commonly seen on the lower limbs, and I never saw any on the face.

Prognosis from the Rose Rash.

Although it is difficult to be sure of generalisations, certain features in relation to prognosis did seem to come out clearly from the mass of cases in the town.

1. Mild cases more commonly had an abundant rose rash than severe cases.

2. Cases whose general condition was improving while the fever was still present usually had a more profuse rash later in the course of the fever than they had in an earlier stage.

3. The later and usually milder cases had a more abundant rose rash than the early ones.

4. In relapses the crops of spots were more profuse than in the primary attack.

On the whole, an abundant crop of rose spots was decidedly favourable in the prognosis of the case.

Rose Rash with a Natural Temperature.

A patient, aged 73, had an attack of typhoid fever. While her temperature was still high, usually 103° at night, she had a few rose spots together with an enlarged spleen and a dirty tongue; her temperature was irregularly raised for nineteen days, it then came down to the 96° - 98° level, and remained there. On the twentieth day she had a profuse rose rash; her tongue had shown no signs of cleaning; her abdomen was slightly distended, painful and tender, while her general condition was unaltered, and she needed much stimulation with brandy, champagne, and strychnia to keep her alive. She ultimately recovered completely.

A boy of 7 was acutely ill with headache, abdominal pain, and distension, and a few rose spots; his temperature remained between 95° and 96° F. for three weeks, then rose to 98° -

99° F. for three days, while his general condition improved somewhat. The temperature then again rose, this time to the 104° level, and remained at that level for about three weeks, when he died of intestinal hæmorrhage. Post-mortem he had some old ulcers in the last two inches of the ileum in Peyer's patches, and four ulcers in the solitary glands of the cæcum; he had also more recent ulcers in the Peyer's patches of the last two feet or so of the ileum, and in the solitary gland of the large intestine as far as the sigmoid flexure. These ulcers showed all stages, from swelling of Peyer's patches with a little superficial loss of substance, to ulceration down to the peritoneum.

A child of 5 years old had an attack of typhoid fever lasting some weeks. After five weeks (or more) of pyrexia, her temperature fell to between 96° and 98° Fahr.; four days later a profuse crop of rose spots appeared, while her tongue became redder and dryer than it had been before, although she had no other signs or symptoms of any kind.

I quote these three cases as they illustrate a point I have not seen mentioned anywhere. The existence of apyrexial typhoid fever is well known, but I know of no mention of an attack combining the characteristics of apyrexial and pyrexial cases, as these three cases seem undoubtedly to do. If, as seems probable, fresh ulceration is going on with a temperature that has fallen below natural after being raised, when is the right time to begin feeding the patient? If the supposition holds, does it not also follow that a relapse is sometimes going on without any rise of temperature, and that when, as happens in the majority of cases, the temperature does again rise, is not the date of the relapse much earlier, and the intestinal ulceration more advanced than is supposed?

Of rashes other than the ordinary rose rash, there were a large number; they came out in all sorts of cases, mild and severe, in hospital and out, without the giving of enemata, with the giving of enemata, and were chiefly characterised by the rapidity of their appearance and disappearance.

The papular rash was the most common—papules dark red, disappearing on pressure, from $\frac{1}{4}$ – $\frac{1}{2}$ inch across at the base, and from $\frac{1}{8}$ – $\frac{1}{4}$ inch in height. They appeared in crops, usually alone, more rarely at the same time as the rose rash; they came and went with the rapidity of rose spots, and occurred almost exclusively on the shoulders and back.

The pustular rashes were rarer than the papular, but similar to them in all respects, except that a tiny drop of pus appeared in the centre.

Hæmorrhagic rash occurred in only one instance that I saw, a case of hæmorrhagic typhoid, in which there were during life hæmorrhage from the lips, gums, mouth, and intestinal tract, and post-mortem hæmorrhages into the stomach and intestine, lungs, pleuræ, and meninges. Two small hæmorrhages appeared under the skin of the right thigh within an hour of death.

The urticarial rash occurred in one case of mine on the seventh day of the illness; he was then seen by gaslight, and for the first time during his attack of typhoid fever. On the next day an urticarial rash was present over the forehead, thorax, abdomen, back, neck, and back of the head, as well as over the extensor aspect of the arms and legs. Rose spots were also to be seen on the back and abdomen.

Erythemata were common, occurring equally in men and women, much less often in children, coming and going with great rapidity. They bore no strict relation to the occurrence of rose spots occurring before, during, or after their appearance.

The face was hardly ever affected; on the backs of the elbows erythema circinata and erythemata iridis were the most common form. These, like all the other abnormal rashes, seemed more closely allied to the septic rashes of pyæmia than any other ordinary form of eruption.

Scarlatiniform rashes were uncommon; one occurred with a typical appearance, and a distribution on the forehead, chest, and abdomen, but nowhere else, on the nineteenth day in a boy of 17 who had a severe attack.

Rubelliform rashes were frequent, morbilliform uncommon. These rashes were seen more often among the early than the later cases, and among severe than mild cases. They also were more like the septic rashes of pyæmia than any ordinary erythema in the rapidity with which they came, went, returned, and went away again.

Abdominal Symptoms.

The clinical feature which ranked next in importance and interest to the suddenness of the onset of the fever was the lack of symptoms referable to the abdomen; very few patients complained of severe pain in the bowels, and very little distension occurred. This absence of abdominal pain did not, however, influence the prognosis for good, although the converse always held good, that a distended abdomen meant severe trouble.

Diarrhœa was present to a slight extent in about one case in ten, and was severe only in about one in twenty to one in thirty cases. In no case did it fail to yield rapidly to treatment.

Abdominal distension was rare, and meant a severe case if present; usually the abdomen was flat, retracted, and supple. Intestinal antiseptics exerted a marked influence on distension, if it occurred.

The spleen could be felt in about one half the cases; the severity or otherwise of the attack bore no relation to its size. In very young children it was frequently enormous, reaching into the iliac fossa in a child of $1\frac{1}{2}$ years old.

Hæmorrhage was common in bad cases, either as a continuous oozing or in a large amount at once. Repeated small losses of blood were much more fatal than one or two bleedings of much greater amount.

In one most interesting case that died from hæmorrhage, a slough had separated from an ulcer in the duodenum about 18 inches from the ileo-cæcal valve; at the bottom of the ulcer was a small hole which communicated with one of the large branches of the superior mesenteric artery.

COMPLICATIONS.

Pneumonic trouble was common, [as was cardiac failure. Perforation decidedly rare, although hæmorrhage was fairly common.

The Lungs.—*Bronchitis*, as shown by rhonchi and sibili, was present in all but the mildest cases. Hypostasis was one of the rarest of complications; true pneumonia was the commonest complication of moment, and seemed to be a characteristic of the epidemic. It affected one or both lungs, and was frequently so extensive that it was difficult to see what air-space was left in the chest. In a girl of 23, both lungs were solid behind, and dull in front up to an inch from the clavicles. The dulness was so resistant that the lung was explored, as it seemed probable that fluid was present. Moist sounds were few, and the air entry absent over three-fourths of the chest, back, and front. In this case permanent improvement in the lung condition and in the pulse occurred from inhalations of oxygen. The lungs cleared completely later on. I quote this as it is characteristic of the epidemic, the most extensive and apparently desperate conditions of lung trouble clearing up rapidly and entirely.

Heart Troubles.

Upon the heart fell the strain in the early and very acute cases. Cardiac failure occurred early, often in two or three days from the onset in maniacal cases; the physical sign usually noted was displacement of the apex beat outwards without a very large amount of increase of the area over which it could be felt. Hæmic murmurs were commonly heard at the base; a double murmur at the apex appeared in some cases, and seemed to indicate a cardiac type of case, with persistent low temperature, but with all the other classical signs of typhoid fever.

Mild and Latent Cases.

A child of 7 years old was notified in the second week in September; she then had a temperature of 100° and a few rose spots; was ill apparently for a few days; her temperature was never over 98.8° after the first day; she was regarded as practically well, but on November 5th she had a temperature of 99.8° , and on November 7th of 99.6° , with a characteristic facial appearance and a few spots. Was this a return case, or a mild case lasting eight weeks, or a relapse? She was never quite well the whole time she was under observation.

These mild and almost unobserved cases came repeatedly under observation towards the end of the epidemic.

Post-Mortem Appearances.

Spots were not seen.

The abdomen was usually not distended; in the intestines the bulk of the ulceration was in the large intestines, close to the valve and extending some way down, at times to the sigmoid flexure.

The post-mortem notes of one case already referred to will illustrate this feature better than a great deal of description. The small intestine was also affected, but never so markedly as the large; in relapses the bulk of the ulceration was in the small intestine.

I hope readers will forgive this somewhat sketchy and disjointed account of the Great Maidstone Epidemic; there is so much still to be said about it that it is not possible to do more than state what seemed to me the most striking and interesting phenomena. Its great and marked peculiarities were the suddenness of its onset, the intensity of the head symptoms,

the comparative absence of abdominal trouble, the unusual amount of infection of the large intestine, and the profusion of rashes.

Of the Isolation Hospitals, the stores of all kinds, and the way in which relief was granted at once and without stint, both of clothing, blankets, nursing necessaries, and of milk, beef-tea, brandy, champagne and any other requisites, I have no time to write, but must leave that to some one else, or for another paper. The organisation of relief was marvellous, and the methods of distribution rapid and satisfactory.

TWO CASES OF
IMPACTION OF A VEGETABLE FOREIGN BODY,
ONE IN THE SUBMAXILLARY, THE OTHER IN THE
SUBLINGUAL SALIVARY DUCT, LEADING TO
OBSTRUCTION OF THE DUCT AND FORMA-
TION OF AN ABSCESS IN THE GLAND.

BY

CHARLES COSENS AND T. RUDOLPH SMITH.

CASE I.—A. B., male, aged 26 years, had suffered at intervals for fifteen months with recurring attacks of swelling of the left side of the neck, involving chiefly the submaxillary region. The attacks were accompanied by moderate pain; and came on suddenly, especially at meal-time. For the last month the pain had been very severe, the swelling had spread on to the side of the face, and he had noticed a discharge of matter from the floor of the mouth. There was considerable constitutional disturbance, and his health had suffered in consequence.

The question of a foreign body being in the submaxillary duct had been entertained and abandoned, though the patient himself attributed the commencement of his troubles to a certain day, eighteen months past (May 1894), when he had been chewing a piece of grass, and had felt a sharp pain in the floor of his mouth. On this occasion a medical man saw him and examined the floor of his mouth, but could find no foreign body. There was at this time some swelling and pain, but in a few days they disappeared and there was no further trouble until the recurrent attacks began three months later.

November 1895.—Patient was first seen. He was then recovering from his latest and most severe attack, which had lasted three weeks. There was still some swelling and tenderness about the left submaxillary region, and pus could be

squeezed out of the orifice of Wharton's duct, which was itself swollen and tender and admitted a fine probe with difficulty. No foreign body could be felt with the probe. But as it was considered that none the less a foreign body of some sort was probably the cause of the symptoms, the patient was advised to submit to a further examination under an anæsthetic.

Accordingly, under chloroform, the left submaxillary duct was laid open in the floor of the mouth, and from it, far back, a piece of macerated grass half an inch long was extracted. The deeper portion of the duct was then well dilated with forceps, as the pus evidently proceeded from an abscess in the gland itself.

For some weeks after the operation the discharge of pus continued, and a probe had to be passed daily to prevent the orifice of the duct unduly contracting. Neglect of this measure was at once followed by increase of the submaxillary swelling and decrease of the discharge.

After some six or seven weeks the discharge gradually diminished and at last ceased, and the patient has been free from any further trouble since then.

CASE II.—C. C., male, aged 32. In July 1890, was walking across a field chewing some grass, when he felt a sudden sharp pain under the tongue, which he attributed to one of the sharp pointed seeds of the grass. His mouth was examined, but nothing could be seen, and after some slight discomfort for two days everything seemed to clear up.

In November 1890 he felt a pricking under the tongue, and on careful examination, the pointed end of a young blade of grass was seen to the right of the frænum linguæ, sticking up through the mucous membrane of the floor of the mouth. This was removed with a pair of forceps, and its identity established by the aid of a microscope.

Following this removal there was constant discomfort, which became acute pain at meal-times, and was accompanied by some swelling in the floor of the mouth.

Wharton's duct on the right side was then laid open and a piece of wire passed along it. Nothing was found and the duct was quite pervious.

After this the pain was somewhat relieved, but a brawny tender swelling appeared under the chin, extending to the under border of the lower jaw on each side. With this there was some constitutional disturbance.

There was no discharge of any kind into the floor of the mouth.

As the skin became red and œdematous, pus was suspected, and a puncture was made in the swelling about three-quarters of an inch behind the point of the chin, and close to the right of the middle line.

The blade was pushed upwards towards the floor of the mouth, and when it had penetrated three-quarters of an inch, two or three drops of thick pus escaped. A small drain of gutta-percha tissue was inserted and the part fomented.

Within a few days the swelling had subsided, the gutta-percha was removed, and the whole trouble came to an end. No grass or other foreign body escaped at the time of the puncture, nor was any found subsequently on the dressings.

Several points are of interest in these two cases. First, as to the rarity of this accident. We can only find one case which is somewhat similar recorded in the medical journals. In the *Archives de Médecine et Pharmacie Militaires*, 1893, Altemari mentions the case of a soldier who had an abscess in the sublingual gland. This pointed, and was opened in the floor of the mouth. No obvious cause was found, but it was thought that some dust or grit had found its way into one of the lingual ducts.

It is not improbable that this accident is more common than would appear from the above statement; but that in most of the cases the symptoms are so slight, and the foreign body, whether dust or something more gross, is so soon expelled in the saliva excreted, that a doctor is not consulted; and even if he is, the condition is attributed to some other cause.

Next, in both the cases the accident was followed by quite trivial symptoms, and there was then a period of quiescence lasting several months. So much so, that in Case I. the subsequent swelling was not considered for a long time to be connected with the slight symptoms following immediately on the entry of the grass. And the cause might easily have been overlooked also in Case II., if the seed had not germinated, and if the young blade of grass penetrating the mucous membrane had not been the first sign of recurring trouble.

In both cases the first important symptoms of recurring trouble were those due to mechanical obstruction of a salivary duct. If, at this stage, it had been possible to detect the presence of a foreign body in Case I., and if it could have been removed, subsequent suffering and risk to the patient might have been avoided.

In Case II. the evidence pointed to the seat of trouble being probably the sublingual gland. But to lay open the sublingual

duct, or rather ducts, would have been almost impossible, owing to their number and extreme smallness.

In two out of the three cases mentioned in this paper the sublingual gland was the seat of lesion; the converse is the case in salivary calculus, which most commonly affects the submaxillary, and rarely the sublingual duct.

The explanation of the course of the inflammation in these two cases is at first sight contradictory.

In Case I. the submaxillary gland was the one affected, and from the anatomical relations of the gland, namely, covered only by skin-platysma and deep fascia, one might have been led to expect that the abscess would have pointed towards the skin surface, rather than into the floor of the mouth.

This is explained by the fact that the main duct starts in that portion of the gland which, passing behind the posterior margin of the mylohyoid muscles, lies on its upper surface, and hence nearer the floor of the mouth. This lobe is first affected when infection reaches the gland *viâ* Wharton duct, and it is by the same route that the pus escapes.

In Case II. the sublingual gland was affected, and from its situation one would expect the abscess to point into the floor of the mouth. If no treatment had been adopted this would probably in time have occurred. But it is hindered by the narrowness of the lingual ducts, and their easy obliteration by the inflammatory swelling of the parts around. Thus while the tissue of the floor of the mouth was undergoing softening, the signs of an abscess also became obvious beneath the chin.

The treatment in both cases ultimately resolved itself into opening and draining an abscess. The disadvantages of the course pursued in Case I., though unavoidable, are very obvious. The pus had to find its way up into the floor of the mouth from the abscess in the submaxillary gland, and as a result healing was prolonged over several weeks.

In Case II. the abscess was evacuated through a dependent opening, and within a few days it had entirely healed up.

Lastly, these cases indicate how tolerant the salivary ducts may be of a foreign body, so long as it does not produce complete obstruction, and how the original cause may long precede the appearance of serious symptoms.

NEW GROWTHS OF THE LUNG AND PLEURA.

BY

SAMUEL WEST, M.D.

The cases which form the basis of this article number 155—55 taken from the published records in the Pathological Society's Transactions, and 100 others—some derived from other published records, some from the post-mortem and clinical records of St. Bartholomew's Hospital, many of them not yet published, and some from my own note-books.

The new growths of the lung and pleura are either innocent or malignant. The innocent tumours are very rare, and are of more pathological interest than of clinical importance. The malignant growths are not so uncommon; but they are for the most part secondary to malignant disease in some other part of the body, and develop in the lung or pleura either by direct extension from parts near, or by metastasis. Malignant disease of primary origin in the lung is rare, and in the pleura rarer still.

NON-MALIGNANT TUMOURS.

The innocent tumours of the lung are fibroma and osteoma, common to both pleura and lung; enchondroma, peculiar to the lung; and lipoma, peculiar to the pleura.

Fibroma.—Fibroma of the lung is a name we hear but rarely now-a-days. Formerly it was given either to small discrete fibrous masses, sometimes in considerable numbers and widely disseminated through one or both lungs, or to large masses limited to a part of one lung. The origin of the masses is often not to be definitely traced, but in many instances they may be referred to past inflammatory or destructive disease. The so-called fibromata, which are peribronchial in seat, are, with but few exceptions, the result of tubercle, and so are most of the isolated fibrous nodules in the lung, though some of

them may be consolidated pulmonary aneurysms, or be the remains of past syphilitic lesion. Where the fibrous tissue is more diffuse, it is frequently of tubercular origin, but may also be the result of pneumo-koniosis, or, where it is limited to a lobe, of a past pneumonia. Cases of this kind are generally dealt with under the heading of fibrosis or fibrotic affections of the lung.

Eliminating cases of these kinds, it is difficult to find a conclusive instance of pure fibroma or fibrous tumour of the lung of an innocent nature.

So also in the case of the pleura, fibrous growth is almost always the consequence of past inflammation. The post-inflammatory thickening may be very considerable, so that the pleura may measure an inch or more in thickness in parts, and a condition may be produced in the pleura which may be fairly compared with keloid in the skin. This has been sometimes described as callous pleurisy (*pleuritis callosa*).

I have come across only one or two cases of fibrous disease of the pleura which seems to deserve the name of fibroma. One case is recorded by Charlwood Turner,¹ in which "a pedunculated body of lobulated form, somewhat resembling a piece of coral, was attached to the base of the lung." There is a similar case in St. George's Hospital Museum.

Lipoma.—Lipoma is the name given to small roundish masses of fat tissue, usually beneath the pleura or between the lobes of the lung. They are very rare.

Osteoma.—Both in the lung and pleura new growths of true bone may be met with, but they are pathological curiosities. In the lung they occur either as irregular spicules or else as nodules or rounded masses; in the pleura, as thin plates. In either case, they have to be distinguished from calcareous deposits in pathological tissues, and these are common enough. The only instance of true osteoma of the lung I have found recorded is described by Virchow² in a woman of seventy, in whom an irregular spicular mass was found in the upper lobe of one lung.

Calcareous deposits, not bone, of irregular shape, are sometimes found in the walls of chronic cavities or in the fibrous tissues of the lung round about them;³ others may be small bronchi or small blood-vessels which have become calcified. The more nodular masses are usually calcified lymphatic glands

¹ Path. Soc. Trans., xxxiv. 19.

² Geschwülste, iii. 100.

³ Luschka, Virch. Arch., x. 550.

or tubercular nodules. One case of calcified enchondroma is described by Forster.¹

Enchondroma.—Enchondroma, though very rare, is the most interesting of all the primary growths in the lung. These tumours originate from the cartilage of the bronchus, and form small rounded masses, usually not larger than a pea or a cherry. They produce no symptoms, and are only discovered accidentally post-mortem.

Among the cases collected there are only six of enchondroma, and this is sufficient evidence of the rarity of the affection. Of these six, two reached a considerable size, and as they also involved glands at the root of the lung and in the mediastinum, they were probably not simple enchondromata, but rather of the nature of chondro-sarcoma. These six cases all occurred in males and at various ages, viz., 28, 39, 44, 64, 66. The origin of the tumour from the cartilage of the bronchus is usually easily demonstrable.

MALIGNANT TUMOURS OF THE LUNGS AND PLEURA.

The malignant tumours are cancer and sarcoma. In both cases alike they are generally secondary, and involve the lung or pleura either by direct extension from the parts near or by metastasis, the former being the most common with sarcoma, and the latter with cancer.

Where the growth spreads by direct extension, it invades all tissues alike.

The metastatic growths no doubt develop in most cases from infective particles carried by the blood, and are thus embolic in origin. Then they spread from a centre, radially and concentrically, so that the resulting tumours are more or less round.

When the infection spreads by the lymphatics, the form of the tumour is different: thus, in the pleura the new growth forms flattened masses of perhaps no great thickness, but possibly of wide extent. At the root of the lung it extends in a radiating fashion for some distance into the lung, following the divisions of the bronchial tubes.

Dissemination may sometimes take place by the air tubes, by means of particles derived from a primary growth in the pharynx, larynx, or large air passages, *e.g.* with epithelioma of the larynx or trachea, or even of the tongue, tonsil, and œsophagus. These different modes of extension are of course often variously combined.

¹ Luschka, Virch. Arch.; xiii. 105.

In the case of the pleura the new growth sometimes extends, as it were, by simple contact; thus, where the parietal pleura has become involved, the visceral pleura opposite may be found affected without any adhesion between the two, and with apparently healthy serous surfaces.

New growths may sometimes spread too through a tissue without obviously involving it; for instance, the diaphragm may be covered with growths on both the pleural and peritoneal surfaces, and yet its own tissue apparently be unaffected.

New growths, whether cancer or sarcoma, are much more common in the lung than in the pleura, as would be expected; for most of them are metastatic, and metastasis is rare in the pleura. Yet there are a few instances in which the pleura has been the only seat of metastatic infection, and the lung has entirely escaped.

SARCOMA.

Sarcoma is a much rarer form of tumour, both in the lung and pleura, than cancer. Thus, out of the cases collected, there were only fifteen cases of sarcoma; yet this by no means represents the relative preponderance of cancer, for a large number of cases of secondary cancer escape record, and in the cases collected from the registers of St. Bartholomew's Hospital I have intentionally excluded most of them. Sarcoma spreads rather by direct extension than by metastasis, and except in the mediastinum or neck the parts about the chest are not the favourite seats of primary growth, and even when the primary growth is near the chest, it often leads to death before the pleura or lungs have had time to become much involved.

Putting aside the cases in which the lung or pleura has become affected by direct extension from the parts about, sarcoma of the lung or pleura is a rare disease, and it is with few exceptions secondary. Thus, of the 15 cases, the primary growth existed in bone in 4 cases, in the liver in 2, in the kidney in 1, in the testicle in 1, in the eye in 1; so that only 5 cases remain in which the growth was of primary origin.

Sarcoma of the Pleura.

Sarcoma of the pleura alone is extremely rare.

There is one remarkable instance of it recorded by Coupland.¹ In this case the whole left side of the chest was occupied by a tumour, the lung being compressed and pushed aside, but not invaded.

The primary growth was a spindle-celled sarcoma of the sciatic nerve, and the secondary growths had developed in the pleura and mediastinum.

¹ Path. Soc. Trans., xxvii. 23.

Sarcoma of the Lung.

In the lung the secondary tumours are, as a rule, of the same nature as the primary growth—*e.g.* osteo-sarcoma, chondro-sarcoma, or melanotic sarcoma; yet they may be of a simple nature, *i.e.*, they need not reproduce the special characters of the original growth; *e.g.* in a case of osteo-sarcoma the secondary growths may be quite soft and contain no bone or calcified deposit, or in the case of primary melanotic sarcoma they need not be pigmented.

The lung appears to be the favourite seat of secondary osteo-sarcoma, in other words, the lung is not infrequently the only seat of secondary growth in the body.

The most striking fact about these cases of secondary sarcoma is the long interval which may elapse from the time that the original tumour was operated on before pulmonary symptoms develop; thus, in one case there was an interval of two and a half years after removal of the humerus, and in another case four and a half years after removal of a testicle. In other cases, however, the interval may be short, not more than a few months, or a year at most.

Though sarcoma is in general the commoner form of malignant disease in the young, this rule does not seem to hold in the case of the lung and pleura. Thus, among the ten secondary cases there were only two instances in young persons at the age of 17 and 18 respectively; the rest were all of adult or advanced age. Even the primary cases were distributed over all periods of life, and were not confined to the young, the ages being 18, 26, 42, 45, 46.

(*a.*) *Secondary Sarcoma.*—The cases of secondary sarcoma do not call for much comment.

The following case, which was under my own care, is a fairly characteristic, though in some respects a noteworthy instance:—

Charles T., aged 18, a carman, was admitted into the Chest Hospital, Victoria Park, on account of dyspnoea. He was found to have a large pleuritic effusion on the right side, which proved to be sanguineous. Nine and a half months previously a tumour had developed in the left tibia, which had been removed by operation, and was found to be a myelo-sarcoma. The patient recovered completely after the operation, and remained perfectly well until a fortnight before I saw him; he had been attacked at that time with pain in the left side and shortness of breath, and a few days later had some palpitation of the heart.

He lay in a semi-recumbent position, was pale and somewhat cyanosed, and suffered with a good deal of dyspnoea, especially on movement.

The physical signs were very remarkable. The whole front of the body, from an inch below the umbilicus to the second rib on each side,

was absolutely dull, and all breath and voice sounds absent, except at the apices, where the vocal vibrations and resonance were increased and the breath sounds somewhat exaggerated. The right side was slightly bulging, the respiratory movements were costal in type, fairly free, and equal on the two sides, but the abdomen was motionless, and diaphragmatic respiration entirely absent.

Tracheal breathing was distinct all along the sternum, even to the xiphoid cartilage, though fainter here than elsewhere.

On the left side there was an area of resonance in the mid-axilla which was thought to be due to the stomach. The only portion of the lungs which seemed to be performing their function was the lower part of the left lung behind.

The pulses were equal but feeble; the temperature was slightly raised to about 100° , but there were no other signs worthy of notice.

Two days later the patient's side was tapped and forty-eight ounces of sanguineous fluid, almost as bright as blood, removed; more could not be taken away because the patient complained of pain and became faint.

The patient gradually sank and died two days later, just ten months after the tumour had been removed from the tibia.

On post-mortem examination, the liver was found depressed and rotated, so that the notch lay under the left costal arch and the gall-bladder two inches to the left of the umbilicus.

The right side of the diaphragm was convex towards the abdomen.

The right pleura contained several pints of blood-stained fluid. The right lung was completely collapsed and airless; the pulmonary pleura was roughened with numerous fleshy vegetations, but the parietal pleura was quite smooth, except in one place corresponding with the seventh rib, two inches from the spine, where there was a lobular, spongy mass, as large as a Tangerine orange, growing from it, but perfectly disconnected from the parts outside the pleura.

The lung was irregular in shape, owing to several tumours in it, one of which occupied the whole middle lobe.

Between the lower lobe and diaphragm, but attached to the lung, was a mass the size of a cricket-ball covered with dark laminated blood-clot.

The pericardium contained a little serous fluid, but no new growth.

In the left lung a large mass, which pushed the pericardium in front of it, occupied the whole of the adjacent portion of the upper lobe, forming an irregular oval tumour 6 inches by $4\frac{1}{2}$. In the rest of the lobe were four or five independent nodules, situated near the surface, and, like the larger mass, of white colour. The lower lobe contained one medium-sized growth and four or five small ones.

The bronchial glands were not involved.

The two layers of the pleura were universally adherent on the left side, but could be easily separated.

The stomach was greatly displaced and twisted, so that the whole greater curvature was in contact with the left side of the thorax, and clearly accounted for the area of resonance previously referred to.

There were no secondary deposits elsewhere. The stump of the femur was carefully examined and the bone divided, but there was no thickening or evidence of tumour in the stump or neighbouring glands.

The tumours in the lung appeared so soft and spongy that some hesitation was felt in making sections of them, lest the preparation should be spoiled for preservation. Some surprise was, therefore, felt in cutting into them to find that they were so hard that the knife could hardly divide them, and even the smallest of them offered considerable resistance. To

the naked eye they presented the typical appearances of osteo-sarcoma, as they proved to be on microscopical examination. The tumours, however, contained no myeloid cells, though in the primary tumour of the tibia these cells existed in large numbers.

The case is remarkable (1.) in respect of the extraordinary physical signs; (2.) in respect of the number of tumours and the large size which they had reached; (3.) in the fact that the patient had but a small portion of one lung left to breathe with; and (4.) in the fact that the patient had been free from symptoms, and thought himself to be well, until one month before his death.

Another somewhat similar case occurred at St. Bartholomew's in the year 1895.¹

The patient was a girl of the age of 17, in whom large tumours developed in the lungs, secondary to chondro-sarcoma of the femur, for which amputation had been performed some months previously.

The tumours in the lung were like those of the femur, viz., chondro-sarcoma. The right lung was almost completely invaded by the tumour, except for a short distance round its root. In the left lung there was a growth the size of a Tangerine orange in the apex, and in the lower lobe another mass, hard and calcareous, which had invaded the pleura and the diaphragm. There were a few small nodules also in other parts of this lung.

A case recorded by Prentiss² deserves mention on account of the long period that elapsed between the removal of the original growth, a sarcoma of the testicle, and the development of the symptoms in the chest and the death of the patient.

After the removal of the testicle the patient remained in good health for four years, when he began to suffer pain in the right side of the chest, had a cough and some blood-stained sputum. The side was explored with a needle, and the diagnosis of sarcoma made by the examination of portions of tissue removed by that means.

The patient lived for twelve months longer, so that five years elapsed between the original operation and the death of the patient. The patient's age at death was 51.

The whole right lung was found to be converted into tumour, and a cavity existed at the base containing two ounces of pus. There were no other secondary growths elsewhere.

(b.) *Primary Sarcoma.*—The cases of primary sarcoma of the lung deserve some further reference on account of their rarity. I have only been able to find records of four cases.

(1.) A case in a man of 46, recorded by Wilkes,³ in which the tumour is described as a fibro-cellular growth in the base of the left lung.

(2.) A case in a man of 18, recorded by Davies,⁴ whose illness began nine months before his death, with cough and pleurisy. He suffered from night

¹ Post-mortem Register, xxii. 210.

³ Path. Soc. Trans., ix. 31.

² Medical News, July 1893.

⁴ Ibid., xl. 46.

sweats, loss of flesh, pain in his left side, and occasional hæmoptysis. Subsequently some glands grew above the clavicle. The patient died fifteen months from the commencement of his illness.

Post-mortem the whole left lung was found involved in the new growth, which extended through the diaphragm and projected into the abdomen. A mass was found above Poupart's ligament of some size. A few secondary growths were found in the liver, but none elsewhere. The tumour was described as a round-celled lymphosarcoma, and it was believed to have originated in the lung.

3. A case in a man of 42, described by Spillman and Haushalter,¹ in which the symptoms resembled cardiac disease. A large sarcoma was found in the upper part of the left lung, measuring 7 inches by 4½.

4. A similar case in a man of 26, recorded by Kronig,² in which there was a primary sarcoma in the right lung, and this was diagnosed early by exploration with the needle.

CANCER.

Cancer of the lung and pleura is much commoner than sarcoma. The general frequency of cancer in these parts of the body is shown by Reinhardt's statistics.³ Thus, out of 8716 autopsies, cancer was the cause of death in 545, and among these the lung was affected 74 times; *i.e.* of the cases of cancer the lung was affected in 13.6 per cent.

In most cases the affection of the lung is secondary and of quite subordinate importance. It is a part of the general dissemination of cancer, though growths are often to be found in the lung without having given any evidence of their presence there during life.

Primary cases of cancer of the lung and pleura, according to Reinhardt's statistics, bear to the secondary the proportion of about 6.8 per cent., but this is probably too high. At any rate, cancer of the lung and pleura appears to be the cause of death in not more than 1 per 1000 of the total mortality.

It is usually stated that primary cancer of the lung and pleura affects the two sexes equally, but that secondary cancer of these parts predominates among women, the reason given being that cancer of the breast and of the pelvic organs is more common in the female. Figures, however, do not seem to bear this statement out, for among the cases upon which these tables are based, out of a total of 61, 14 only occurred in women and 47 in men; a proportion, roughly speaking, of 3 men to 1 woman.⁴ Similarly, Hasse⁵ gives the proportion of 4 to 1; Köhler, of 5 to 3.

The Kind of Cancer.—The forms of cancer met with vary to

¹ Gaz. Hebdom., 1891, No. 48.

² Berl. Klin. Woch., 1877, p. 51.

³ Arch. f. Heilkunde, 1878, xix. 369.

⁴ Loc. cit.

⁵ Kreb's Krankh., 1853.

some extent, according as the growth is of primary or secondary origin, and according as it is the lung or pleura which is chiefly affected.

Colloid and melanotic cancer never affect the pleura at all except by direct extension, and in the lung these forms are, without exception, secondary to similar growths elsewhere, in the abdomen especially in the case of colloid, and in the eye or skin in the case of melanotic cancer.

Epithelioma, again, is, as a rule, secondary to growths of this nature in the larynx, trachea, or tongue, and the dissemination is doubtless by the air-tubes. It may also develop by metastasis, the primary growth being in a distant part of the body.

Thus, Godlee¹ records the case of a man of 78 who was the subject of epithelioma of the bladder. A secondary growth of some size, the only one in the body, was found post-mortem in the lower part of the left lung—a typical epithelioma with cell-nests.

Arnott² also gives an instance in a woman of 50, secondary to epithelioma of the clitoris. In this case the pleura was extensively involved as well.

Medullary Cancer.—This is the form of cancer that is most frequent in the lung; *i.e.* the growth in the lung is soft and contains little fibrous tissue, and that even when the primary growth has been scirrhus. There is, however, one exception to this rule, namely, when the growth is primary at the root of the lung, for in this case, as also in primary cancer of the pleura, there is generally a large amount of fibrous tissue.

Although the lung and pleura are generally affected together, still they may be affected independently of one another, and that when the growth is secondary as well as when it is primary; and as cancer presents some pathological as well as clinical peculiarities, according as it affects the lung or the pleura, it will be convenient to deal with these forms separately.

In the case of cancer of the lung, again, the clinical problems differ according as the new growth affects the body of the lung or its root.

The subject, therefore, divides itself conveniently into three parts, which can be dealt with separately, *viz.*, cancer of the pleura, cancer of the body of the lung, and cancer of the root of the lung.

¹ Path. Soc. Trans., xxxii. 30.

² *Ibid.*, xxii. 231.

CANCER OF THE BODY OF THE LUNG.

Cancer of the body of the lung may be primary, but is in the great majority of cases secondary.

(A.) *Secondary Cancer of the Lung.*

Cancer may involve the lung secondarily either

- (1.) By direct extension from the parts near, or
- (2.) By infection,
 - (a) Through the blood-vessels,
 - (b) Through the lymphatics, and
 - (c) Lastly, through the air-tubes.

(1.) *By direct extension from the parts near, i.e.* from the neck, mediastinum, chest-walls, or abdomen. In these cases the growth in the lung is likely to be localised and unilateral; whereas in the case of infection the secondary growths are usually irregularly disseminated more or less through both lungs.

Where there is an external or palpable tumour this group of cases presents little interest, for the symptoms are subordinate to those of the primary growth. Where, however, the primary growth is deep seated—as, for example, in connection with the vertebræ, lymphatic glands, or mediastinal tissues—the pulmonary or pleural symptoms, as the case may be, may be among the earliest to attract attention, and the diagnosis of new growth is very difficult; but the difficulties are the same as with primary cancer of the lung, from which the diagnosis is often impossible during life.

In most cases of direct extension the different layers of the tissues are involved one after the other until the lung is reached; but in some instances the affection seems to spread through one tissue without involving it much, if at all. For example, the diaphragm may be found covered with new growth on both its serous surfaces, the peritoneal and the pleural, and yet the tissue itself have apparently escaped. No doubt the infection in these cases travels by the lymphatics.

(2.) *By Infection through the Blood-Vessels.*—As in the case of embolic infarcts, the masses are multiple and irregularly scattered over the whole of both lungs. Each spreads from a centre and grows concentrically, so that its shape is more or less rounded.

Usually the number of secondary tumours is not very great, and judging by their different sizes they must be of different ages; that is to say, the infection must have taken place at different times.

Occasionally the masses are very numerous and minute, or even miliary in size, so as to resemble in general appearance miliary tuberculosis. On the analogy of tuberculosis these cases have been described as **carcinosis of the lung**. The condition is a very rare one, and it may develop in connection with a primary tumour of the lung, as well as with a primary tumour in any other part of the body.

A case of this kind occurred in St. Bartholomew's Hospital.¹ A girl of 16 suffered with cancer of the bones of the head and face. When she died, the lungs were found studded with minute nodules of new growth, and there were many of small size also disseminated in the various organs of the body.

A similar case is recorded by Risdon Bennett² in a girl of 15. She suffered for three months with what seemed to be general bronchitis, with loss of strength and flesh. She died at the end of the fifth month of illness. Many tumours were found in the liver, lumbar glands, spleen and kidneys, and with miliary dissemination in the lungs.

Other cases are also recorded by Fagge and Bristowe.

Fagge's case occurred in a man of 50.³ The case had been regarded during life as one of bronchitis, with more or less pneumonia.

Post-mortem serous fluid was found in both pleural cavities, and also some new growth in the pleura. Both lungs were studded with nodules, the largest being the size of hemp-seeds. There were also several nodules of small size in the pericardium, in the substance of the left ventricle, and also in the liver and spleen. The new growths were soft, and thought to be primary in the lung.

Bristowe's case⁴ occurred in a woman of 36, whose lungs were studded with small nodules of cancer. There were three or four small growths also in the liver, but none elsewhere.

Of the four recorded cases, the first two were obviously secondary, and the two latter were regarded by the authors as primary.

(b.) *By injection through the Lymphatics.*—In the case of a primary abdominal cancer, when the lymphatic glands about the spinal column are affected, the new growths may extend upwards in the course of the lymph stream, pass between the pillars of the diaphragm, and so involve the lymphatics of the mediastinum. In many of these cases the extension takes place from the affected glands direct to the lung, or it may extend to the lung along the root. In a similar way the

¹ Post-mortem Register, xx. p. 115.

³ Path. Soc. Trans., xviii. 29.

² Intrathor. Tumours, 13.

⁴ *Ibid.*, xi. 35.

lymphatics of the mediastinum or root of the lung may be infected by a cancer of the neck.

Again, with cases of cancer of the peritoneum or of the liver, the infection may spread from the abdominal surface through the diaphragm to the pleura and lungs, and sometimes without any obvious change in the tissues of the diaphragm itself. The infection in this case no doubt takes place through the lymphatics.

In an interesting case at St. Bartholomew's Hospital in a woman of 36, who died with general cancer of the peritoneum and liver, secondary to cancer of the rectum, the diaphragm was covered on both sides with masses of growth, as were also the corresponding parts of the lower lobes of both lungs, and that without adhesion between the pleural surfaces, yet the muscular tissue of the diaphragm itself appeared to be quite unaffected.

The same may occur in the walls of the thorax, and thus after cancer of the breast the parietal pleura may be found widely involved without direct connection being traced to the pleura through the chest-walls.

The most interesting mode of infection through the lymphatics is that in which the new growth spreads across the pleural cavity without any adhesions or direct connection between the two surfaces, as in the case just cited. The most striking instances of this kind occur in connection with cancer of the parietal pleura. Then there may be found on the part of the lung opposite a network of lymphatics infiltrated with cancer, and yet both the pleural surfaces may be perfectly smooth and without adhesions through which the infection could have directly passed. No doubt the infection in this case is carried by the lymphatics across the pleural cavity, and is picked up by the stomata on the surface opposite.

Lastly, it is possible for the infection to spread up along the lymphatics to the thoracic duct, and thus be introduced into the veins. This may account for some of the instances of wide dissemination, especially in the lungs.

(c.) *By injection through the Air-Tubes.*—This is an important mode of secondary dissemination in the lungs, especially in the case of some of the rarer forms of tumour. Thus, instances of true epithelioma of the lung are described in connection with new growths in the larynx or trachea, and occasionally also with new growths of the pharynx or tongue. In cases also where a new growth in the lung itself, or near it, has communicated with a bronchus, it is often through the air-tubes that the dissemination takes place.

Godlee¹ records a good instance of epithelioma of the lung following a primary growth in the tongue. The tumour in the lung presented perfectly characteristic appearances, and contained typical cell-nests.

A similar case is recorded by Hutchinson² secondary to the tongue, and another by Broadbent³ secondary to a growth in the larynx.

(B.) *Primary Cancer of the Lung.*

Primary cancer of the lung, whether of the body or the root, is usually unilateral. It often remains a single mass, though by secondary infection from the primary growth others may develop in the lung, or even general dissemination occur. It is with cancer of the body of the lung that the largest masses are found; for then the growths may invade the whole of the lung, and the mass weigh several pounds; *e.g.*, 90 oz. (Suckling⁴), 6 lbs. (Graves⁵), and 9 lbs. (Lobstein).

With cancer of the root, however, the mass is generally small, and may be easily overlooked; but it is in this case that the more marked secondary changes occur in the rest of the lung, owing to the interference of the growth, small as it is, with the bronchi, blood-vessels, and lymphatics at the root.

Sex.—Of 61 cases of primary cancer of the lung, 47 occurred in men and 14 in women, a proportion of about 3 to 1.

Hasse gives 17 males to 5 females; Reinhardt, 16 males to 11 females; together giving 33 males to 16 females, or a proportion of 2 to 1; and Köhler's statistics give a proportion of 5 to 3.

Though the actual figures differ somewhat, all show the same relative preponderance of primary cancer of the lung in males.

Age.—The ages are given in the following table:—

Table of Ages of Primary Cancer of the Lung.

Ages	20		25		30		35		40		45		50		55		60		65		70 and above.	
Sex	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
...	2	2	2	...	3	1	1	...	6	1	5	1	7	1	4	2	7	2	5	2	5	2
Totals	4		2		4		1		7		6		8		6		9		7		7	
...	10						8				14				15				14			

¹ Path. Soc. Trans., xxxii. 27-30.

⁴ Lancet, 1884.

² Ibid., xii. 46.

³ Ibid., xii. 44.

⁵ Clin. Med., ii. 64.

These tables show that cancer of the lung, like cancer of the other organs, is more frequent after 40 than before, in the proportion of about 1 to 3.

Only 4 cases occurred under the age of 20, and of these all except one at the age of about 17 or 18. The youngest case on record is that reported by McAldowie¹ in a child of 5½ years.

Seat.—The seat is shown in the following table:—

	Right Side.	Left Side.
Upper part	9	4
Middle	5	1
Lower	4	8
Whole of one lung	2	3
	20	16

In 60 cases it affected the root in 17, and the body of the lung in 43.

It is more common on the right than on the left side, in the proportion of 3 to 2.

The combined statistics given by Wilson Fox show the right lung to have been affected in 49 cases, and the left in 32.

Of the cases of cancer of the body of the lung, the upper part was affected in 13 cases, the middle in 6, the lower in 12, and the whole of the lung in 5.

Two cases are recorded of primary carcinosis of the lung, the growths being in one case minute and miliary, and in the other of somewhat larger size or nodular.

The Nature of the Growth.—In primary cancer of the body of the lung the growth is nearly always of the medullary type, but at the root of the lung scirrhus, *i.e.* contains much fibrous tissue.

I only know of one case recorded of primary epithelioma of the lung.²

This was a growth of large size, located in the right, middle, and lower lobes, showing typical epithelioma structure with cell-nests.

Primary Cancer of the Root of the Lung.

This is of the fibrous form, and is usually described as cancer; recently some of the cases have been called sarcoma—large-celled or alveolar sarcoma. This is probably merely a difference of terminology; but the point of importance is that these tumours of the root contain a large amount of fibrous tissue, which contracts considerably, and thus produces compression of the bronchi primarily, and subsequently of the vessels and lymphatics at the root.

¹ Clin. Med., 1876, ii. 57.

² Wolf, Fortschr. des Med., xiii. 725.

The root of the lung may be affected, of course, by extension from a primary growth in the mediastinum, but there is, as a rule, no difficulty in distinguishing the cases of primary root carcinoma from those secondary to mediastinal tumour; for with root cancer the mediastinum is affected but little, if at all.

The pathological appearances are striking. The lung on the affected side is usually somewhat smaller than the other. If a section be made through the lung from the surface to the root, a whitish mass is seen radiating some distance from the root into the lung, surrounding the bronchi and following their divisions. It is rarely of any great thickness, even at the root, and may not measure there as much as half an inch, and this rapidly tapers off as the bronchi divide, until, at a distance of 2 or 3 inches from the root, it may not be visible as more than a narrow band. It is hard on section, and cuts like fibrous tissue. In the centre of it are embedded the bronchial tubes, which are often considerably compressed, sometimes almost completely obliterated. The radiating arrangement of the growth is very striking, but the actual amount of growth is really small, so that the growth may be easily overlooked, and the lesion missed if not searched for.

The tubes may be empty, but frequently contain pus. It is unusual for them to present any lesion of their inner surface, but now and then the new growth perforates the walls. It may then appear in the lumen as an ulcer or as a papillary growth.

In the case of a primary cancer of the bronchus which has invaded the peribronchial tissue, the growth in the bronchus is evident, either as a tumour or as an ulcer; and when it has extended outside, it does not spread into the lung in the same radiating fashion, but remains more as a localised tumour.

Because of the compression of the air-tubes, vessels, and lymphatics, secondary changes in the lungs are more common with these forms of root-tumour than with those of the body of the lung.

Of 16 cases of primary root-cancer, 12 occurred in men and 4 in women. Both sides were affected equally, *i.e.* the right in 8 instances, and the left in 8. The age was in all cases above 35, and the cases were distributed in age periods as follows:—

Age periods .	40	45	50	55	60	65	70, &c.
Total . 17	2	3	1	1	2	5	2

The Secondary Lesions Resulting from Cancer of the Lung.

Primary tumours of the lung often remain localised in the lung. They may thus grow to a considerable size, and sometimes involve the whole lung.

If they spread beyond the lung, they may involve the mediastinum or adjacent parts, or they may implicate the neighbouring lymphatic glands round the bronchi and trachea on the one hand, or on the other, in the neck, and thus enlargement of the cervical glands above the clavicle is not uncommon.

Sometimes a primary growth in the lung may perforate a bronchus, and form a papillary or fungating mass within it, which may spread some distance along it. Portions of the tumour may then become detached and be coughed up. In one case an actual cast of the tube, composed of the new growth, was expectorated.¹ Particles may also be detached and sucked into other bronchi, and there form centres of inflammation or of fresh growth.

There is an instance recorded² in which the pulmonary vein was invaded, and a small papillary tumour found within it; and another³ in which the growth made its way into an old tubercular cavity, and presented there as a villous or fungating growth within it.

Lastly, a primary growth in the lung may become disseminated, and lead to secondary growths, most commonly in the lung itself, but sometimes in other parts.

It is, however, the secondary changes in the lungs themselves and in the pleura that are of chief interest.

Where there is a large mass in the lung the parts around may be emphysematous, but more commonly they are somewhat collapsed, especially in the parts immediately round the growth which have not yet been invaded.

If the bronchi, blood-vessels, and lymphatics are compressed by the growth, considerable changes are likely to be produced in the parts of the lung corresponding with the obstructed vessels. Such obstruction is most likely to occur when the growth is at the root.

If the obstruction to the bronchial tubes is considerable, so that the air cannot freely enter the lung, the corresponding portion of the lung becomes collapsed, and subsequently cedematous.

¹ Peacock, *Path. Soc. Trans.*, xi. 65.

² Bristowe, *ibid.*, xi. 25.

³ Kidd, *St. Bartholomew's Hospital Reports*, xix. 227.

If the blood and lymphatic vessels as well as the air-tubes are compressed, the lung passes into the condition described as "solid œdema;" *i.e.*, it is airless, and the vessels are filled with exudation, partly serous and partly cellular.

In this a sub-acute inflammation may develop, and thus patches of consolidation like broncho-pneumonia be produced.

After a time the central portions of the consolidated areas may degenerate, necrose, or even gangrene. These degenerating patches are often described as "softened secondary growths." Cancer of the lung, however, does not usually soften and break down, and most of the softened masses described are simply areas of inflammation which have undergone necrotic degeneration. If by communication with an unobstructed bronchus the degenerate products can be discharged, a cavity results. The size of such cavities is sometimes considerable. Rosenberg describes one as large as a "child's head."¹

Cavities in the lung in connection with new growth have three sources: (1.) the necrosis of degenerate inflammatory tissue; (2.) the softening or breaking down of the new growth; (3.) they may be of tubercular origin, and antecedent to the new growth. The occurrence of cancer in the course of chronic phthisis is not altogether rare,² for there is no incompatibility between cancer and tubercle, as was once stated.

When the new growth reaches the pleural surface, inflammation of the pleura is likely to follow. This may lead to adhesions, through which the cancer may spread to the walls of the thorax. Often it leads to effusion; the fluid being usually serous in character and blood-stained, but it may be purulent, though this is rare. Lastly, the pleura may be perforated and pneumothorax occur. This is perhaps the rarest complication of all, and I know only one instance of it.

Primary Cancer of the Main Bronchi.

In connection with primary carcinoma of the root of the lung, primary cancer of the bronchi should be mentioned also, for the clinical symptoms are in many respects similar.

As already stated, primary cancer of the root develops round the bronchus, and not from a primary tumour or ulcer in a bronchus.

Primary bronchial cancer is very rare. Of 11 cases in which the bronchi were involved, in 2 certainly and in 3 others in all probability, the affection of the bronchi was secondary to cancer outside it.

¹ Reinhardt, Virch. Arch. 1898, xix. 369.

² Wolf, loc. cit.

Thus, only 6 cases of primary bronchial cancer are left. Of these, one presents simply a tumour in the lumen, and one an ulcer, without other changes. The other four had secondary changes also.¹

1. A man of 70. The affected lung contained several secondary growths.
 2. A man of 55. The tumour occupied the cavity of the right main bronchus; the glands surrounding the root were enlarged; the bronchi of the lung were filled with pus, and there were several patches of broncho-pneumonia in the upper lobe; there were secondary nodules in the liver and abdominal glands, and two small secondary growths in the upper lobe of the left lung.

3. A man of 58. The right main bronchus contained a cauliflower growth, which also filled the bronchi of the middle and lower lobes; the growth invaded the neighbouring bronchial lymphatic glands, and formed a small papillary tumour in the right pulmonary vein; secondary growths were found in the left lung, as well as in the dura mater and some other parts.

4. A man of 42. The growth started at the bifurcation of the trachea, and spread along both bronchi; a cavity had formed at the left base, which had opened into the pleura; one secondary growth was found in the brain.

The growths are described as squamous-celled or cylindrical-celled carcinoma in about an equal number of cases, and they are supposed to arise from the mucous glands or the epithelium of the tubes.

These cases of bronchial cancer appear to be of short duration and to terminate early, as the result of the secondary mischief they usually produce in the lungs.

SECONDARY CANCER OF THE PLEURA.

Cancer of the pleura is in most instances secondary, and the result of direct extension from some cancerous growth in the parts near it. Usually adhesion takes place between its surfaces, and the growth spreads directly through the pleura to the parts beyond. These cases call for no comment.

At other times the growth in the pleura plays a more independent rôle.

The growths may occur as small, lenticular patches, about one-half of a line to a line in diameter, of the thickness of cardboard. They are occasionally in considerable number and irregularly scattered.

The condition closely resembles that met with in some forms of tubercle of the pleura.

These masses may become confluent, and so form patches of larger size, the "plaques cirrheuses" of Cruveilhier.

¹ Wolf, *loc. cit.*

The patches are usually thicker in the centre, but may be thickest at the periphery, where they are extending.

This is the usual form in which cancer of the pleura occurs when it is associated with secondary disseminated nodules in the lungs.

A very considerable extent of the pleura, or even the whole of it, may become involved in this way, and when the visceral pleura is the chief seat of disease it may form a sort of capsule to the lung, which in places may be of considerable thickness, even as much as an inch or more.

Extensive as the disease may then be, it may still be limited to the pleura, and not involve the lung at all, except so far as it extends along the interlobar septa.

In another interesting form the cancer may develop tumours which project into the pleural cavity. These are commonest on the parietal or diaphragmatic surface. They are for the most part sessile, *i.e.* have a broad base with rounded or nodular surfaces, and they may reach the size of a filbert or a small orange. At other times they may be pedunculated, and in a few instances have formed enormous tumours.

Wilks describes a case in a man of 30,¹ following a primary growth in the fibula. Three or four secondary nodules of small size were found in each pleura, and one on the right side as large as the heart, growing from the surface of the visceral pleura and pendulous.

In some instances the growth, though secondary, undergoes the most extraordinary development in the pleura. This is most frequently seen in the costal pleura subsequent to cancer of the breast, or in the diaphragmatic pleura secondarily to cancer of the peritoneum. In the latter case the growths may extend through the diaphragm, apparently without involving the muscular tissue.

Thus, in a case² at St. Bartholomew's Hospital the cancer was primary in the peritoneum, and from each surface there were pendulous nodular masses as well as similar nodular masses on the under surface of both lungs connected with the visceral pleura.

In another case under my own care at the Chest Hospital, Victoria Park, in which the left breast had been removed for cancer two years previously, the patient came under observation for chest symptoms, and died. On post-mortem examination, the whole mediastinum was found invaded by cancer, which had spread from the pleura just below the amputated breast, and from the mediastinum the growth had spread to the pericardium and to both pleuræ. On the right side the whole pleura was involved, parietal, costal, visceral, and diaphragmatic, so that the lung was enveloped in a thick capsule measuring at the root and at the diaphragm more than an inch in thickness.

¹ Path. Soc. Trans., x. 244.

² Post-mortem Register, vol. xx. p. 384.

The pleural cavity was completely obliterated, except for a space at the base, which held a pint of blood-stained fluid.

The left pleura was affected similarly, but on the visceral surface only near the root. From the chest the growth had spread to the peritoneum through the diaphragm, but without involving the muscular substance, though the peritoneal surface, like the pleural, was covered with a thickened layer of new growth. The capsule of the liver was similarly involved, and so more or less was the whole peritoneum.

The new growths were confined to the serous membrane, and no secondary nodules were found in the liver or in the lung, or in any other organ.

Secondary growths, however, may affect the visceral pleura and be confined to it where the primary growth has been in some distant part, without any direct connection being evident, *i.e.* metastasis may be confined to the pleura, as in the following case :—

The new growth was in the lower part of the peritoneum ; the only seat of secondary growth was in the visceral pleura of the lung. The diaphragm was free, as well as the parietal pleura of both lungs ; at the base, however, the visceral pleura was covered with numerous secondary nodules on both sides.

PRIMARY CANCER OF THE PLEURA.

Cancer of the pleura may be primary. It is a very rare affection, and I have only been able to find twelve cases recorded.

In 11 of these, 7 occurred in men and 4 in women; the right side was affected in 6, the left in 3, and both in 2.

The ages were as follows : 10 years, 37 (two cases), 43, 44, 46, 54, 58 (two cases), 61, and 69.

The growth is variously described as “columnar-celled carcinoma,” “cylindrical-celled carcinoma,” or “epithelial cancer.”

It is characterised in all cases alike by the amount of fibrous tissue which it contains, so that it cuts almost like a piece of tendon.

The following is a brief abstract of the recorded cases :—

1. M., 54.¹ Left pleura. Serous effusion. Tapped sixteen times ; often 70 to 90 oz. at a time. Empyema. Rib resected. Malignant disease found. Death shortly after. Duration, 18 months. Post-mortem, very extensive infiltration of the whole left pleura, costal, visceral, and diaphragmatic. Growth extending also between lobes. Cylindrical-celled carcinoma.

2. F., 58.² Similar growth, right side. Duration, 14 months. Tapped twice, but little fluid obtained. Post-mortem, right pleura very thick, from one to two inches. Interlobular tissue also involved from a half to a quarter of an inch thick. Lung completely encased. In one place

¹ Benda, *Deut. Med. Woch.*, May 20, 1897.

² Thomas Harris, *Journal of Pathology*, vol. ii.

only growth extended as a small nodule into lung. Cylindrical-celled epithelioma.

3. M., 37.¹ Pleural effusion. In the last two weeks of life hæmoptysis almost daily, sometimes in a considerable amount. Duration, 10 months. Post-mortem, pleura from a quarter to three-eighths of an inch thick. Growth extending also from the root into the lung and between the lobes; similar growths in the liver and the glands above the clavicle; some inflammatory changes in the lung, with small cavities. Squamous epithelioma.

This is a mixed case, but the growth was probably primary in the pleura.

4. F., 58.² Pain in the side. Dyspnœa. Dry cough for 15 months. Post-mortem, numerous hard nodules in the right pleura and on the diaphragmatic surface, and a few also in the lung. Scirrhus.

5. M., 64.³ Ailing a few weeks only, possibly seven. Admitted with right pleural effusion. Death from dyspnœa. Post-mortem, right pleura filled with 140 oz. of blood-stained fluid; numerous growths of the size of beans or peas, confined to the parietal pleura and diaphragm. Cancer.

6. F., 46.⁴ Ailing for two or three years. Cough and dyspnœa for two months. Hemorrhagic pleural effusion on the right side. On paracentesis fluid contained numerous epithelial cells, from which the diagnosis was made of cancer. Post-mortem, right pleura contained 50 to 60 oz. of blood-stained fluid; right pleura an inch thick in places, white, tough, like fibrous tissue; right half of the diaphragm infiltrated; nodular growths on the peritoneal surface of the diaphragm, also on the capsule of the liver; secondary growths in the peritoneum, and also a few in the left pleura the size of a pea or so; one nodular mass of small size in the lung on right side; tumour composed of dense fibrous tissue with columns of epithelial cells.

7. F., 61.⁵ For one year cough, dyspnœa, pain in the left side, and loss of flesh. Left arm weak recently. Post-mortem, left lung collapsed; pleura containing 26 oz. of blood-stained fluid; the left costal pleura one-fifth of an inch thick, on the posterior surface one quarter of an inch thick; dense infiltration of the diaphragm from a third to half an inch thick; secondary growths in supraclavicular glands, along the œsophagus, the bifurcation of the trachea and the arch of the aorta; nodules on the parietal and visceral pericardium, and a few also in the liver and kidneys. Cylindrical-celled epithelioma.

8. M., 43.⁶ Illness commenced with dysphagia eight months before death. Rapid loss of flesh. Large right-sided effusion. Blood-stained fluid. New growth of the lower part of the right pleura and diaphragm, extending a little on to the left. Nodules on the abdominal surface of the diaphragm. Glands of the posterior mediastinum and of the abdomen a little enlarged and colloid. Epithelial cancer.

9. N.⁷ Hæmorrhagic effusion. Primary medullary cancer of the right pleura, with some secondary nodules in right lung and in the liver.

10. M., 37.⁸ Obstinate pleural effusion. Paracentesis showed a few epithelial cells. Case thought to be one of new growth. Post-mortem, diffuse infiltration in patches and in confluent masses half an inch thick;

¹ Thomas Harris, *Journal of Pathology*, vol. ii.

² Mayne, *Dublin Hospital Gazette*, 1857, p. 21.

³ Coats, *Glasgow Medical Journal*, 1889, p. 19.

⁴ *Path. Soc. Trans.*, xlv. 15.

⁵ *Ibid.*, xxxix. 56.

⁶ Collier, *Lancet*, 1885, No. 21.

⁷ Kanders, *Wien. Med. Bl.*, 1880, Nos. 18 and 22.

⁸ Neelsen, *D. Arch. f. Klin. Med.*, xxxi. (1882), 375.

lung compressed by fluid, but free from tumour, except for small nodules on section, which had developed from strands following the lymphatics; left pleura slightly affected. Endothelial cancer.

10A.¹ A similar case, a museum specimen, described by the author. He calls both the cases endothelial carcinoma, or *Syn. Pleuritis carcinosa* or *Lymphangitis carcinomatodes*.

11. M., 44.² Eight months losing flesh and strength, with pain in the side. Came under observation with left pleural effusion. Polymorphic epithelial cells found in fluid, which was blood-stained. Diagnosis made of new growth. Post-mortem, left pleura uniformly thickened a quarter of an inch; no tumours; growth looked like connective tissue; no tubercle bacilli—endothelial cancer; metastatic growths connected with the lymphatics of the bronchi, mesentery, and retro-peritoneum.

The author considers that these cases are often confused with fibrous or callous pleurisy.

The disease has also been called *Lymphangitis carcinomatodes*, or better, *Lymphangitis prolifera*.

12. F., 10.³ Right pleura very thick. Cavity obliterated, except for a space at the base holding three or four ounces. Lung collapsed. New growth spreading along interlobar and interlobular septa; a few discrete nodules on the left pleura. Carcinoma.

SYMPTOMS AND PHYSICAL SIGNS.

Of the symptoms and physical signs of new growth of the lung and pleura we can hardly speak precisely, for none are pathognomonic or constant, and all may be absent.

Practically we may limit our consideration to malignant disease, *i.e.* to sarcoma and cancer; for the innocent tumours are very rare, and for the most part give no evidence of their presence.

Onset.—In many cases the symptoms develop gradually, but in some instances the onset is sudden; the symptoms being due to the rapid development of some complication.

Thus, a man,⁴ aged 39, was in fair health till he was seized with a sudden illness like pneumonia. He had much fever, lost flesh rapidly, and sweated much at night.

Six weeks later he was admitted with signs of pleural effusion, it was thought probably purulent. After an exploratory puncture an incision was made and 8 oz. of pus evacuated.

The diagnosis of malignant disease was made, but little relief was experienced; as the result of the operation, the patient died of exhaustion three months later, four and a half months in all from the commencement of his illness.

The incision led into a cavity in the base of the lung. There was also another of smaller size near it. The malignant disease existed at the root of the lung and extended for some distance into it.

Another case of the same kind in a man of 62 is recorded in the same paper.

¹ Neelsen, D. Arch. f. Klin. Med., xxxi. (1882), 375.

² Fränkel, Verhand. d. Congr. f. Inn. Med., 1892, p. 374.

³ Lepine, Bull. de la Soc. de Anatom., 1869.

⁴ West, Path. Soc. Trans., xxxvi. 84.

Symptoms.—The chief symptoms are dyspnoea and pain in the chest; cough is common, but expectoration accidental.

When the growth is malignant, the history of the case, the loss of flesh and strength, and the general cachexia may assist the diagnosis.

The variability in the symptoms and physical signs is to be explained by the position of the growth, by their size and number, and by the complications which have been produced.

Dyspnoea.—In the body of the lung there may be a single large growth or several smaller ones without the breathing being affected at all.

This depends not so much upon the size of the tumours as upon their slowness of growth; the lungs having had time to adjust themselves gradually to the altered conditions.

Thus, in the case of osteosarcoma described, although the tumours were very large and in both lungs, symptoms were entirely absent until four weeks before death, and then the dyspnoea was chiefly due to a pleuritic effusion which developed rapidly.

When the tumours are of rapid growth, dyspnoea is hardly likely to be absent.

Again, if the tumours are very numerous though small, the shortness of breath may be considerable, and so greatly in excess of the apparent mischief in the lung as of itself to excite suspicion. This, as would be expected, was the case in those rare instances of carcinosis, which in general features closely resemble disseminated tuberculosis of the lung.

A sense of pressure or compression in the chest is occasionally complained of. It generally stands in relation with the dyspnoea, but it is not constant in tumour, and occurs in other affections.

Pain.—Pain is not likely to be present unless the pleura is involved or the nerves pressed upon in some part of the chest. Where the intercostal nerves are interfered with the pain may be referred to distant parts, and in one case, which I have described, the earliest symptom was intercosto-humeral neuralgia, pain, that is to say, felt in the upper intercostal spaces, extending also down the inner side of the arm as far as the elbow.

Cough.—Cough is frequently absent. It varies with the amount of secretion in the air-tubes and the difficulty of its expectoration. It may be paroxysmal, but it is not often a troublesome symptom.

When complications occur, the symptoms due to them are introduced, and are likely either to mask completely the signs of tumour or greatly to increase the difficulties of diagnosis.

Decubitus.—This is one of the most suggestive symptoms.

The patient finds that some position or another either produces pain or difficulty in breathing or greatly aggravates them, and to avoid this adopts some other position which is more or less constant throughout the case.

The decubitus varies greatly in different cases. Sometimes it is the affected side the patient avoids, sometimes the opposite one, more often the patient is only comfortable when lying upon the back with the shoulders raised.

Of course, if there be a pleuritic effusion this will largely determine the position preferred, but in the absence of such complication the explanation usually lies in the relation in which the tumour stands to the root of the lung and the diaphragm, the patient finding that position most comfortable which most relieves those parts of pressure.

Physical Signs.—The physical signs vary according as the tumour is deep-seated or near the surface, the pleura involved, or secondary changes in the lungs present.

If the pleura be involved, the usual signs of an affection of the pleura will be present, viz., dulness to percussion and diminution or absence of the voice and breath sounds.

If the pleura be not affected and the tumour deep-seated, there may be no physical signs at all, so long as the surrounding lung tissue contains air.

If the tumour be close beneath the chest-walls or the lung consolidated, the percussion will be impaired; the voice and breath sounds may be increased and altered; but owing to the obstruction which the tumour causes to the entrance of air into the affected part, they are more often diminished or absent, and then the diagnosis from affections of the pleura becomes very difficult.

On inspection, no changes in shape or movement are often to be detected; but if the tumour be large, or there be a large pleuritic effusion, the affected side may be distended. On the other hand, the side may be smaller if the tumour be at the root of the lung and the lung collapsed.

If there be any change in the shape, whether by way of increase or of decrease, the respiratory movements will be diminished.

If the tumours in the lung be numerous and of small size, the physical signs may resemble those of disseminated bronchopneumonia, and as, in the adult, this is usually of tubercular origin, such a case is likely to be diagnosed as phthisis; especially if, as frequently happens, the temperature be raised. Thus, in Fagge's case of carcinosis, the only diagnosis made during life was that of bronchitis and broncho-pneumonia.

It is when the primary tumour is at the root of the lung that the physical signs become most puzzling. Here the side may be contracted and the breath and voice sounds diminished, or even completely absent. So long as no secondary changes occur in the peripheral parts of the lung, the percussion may not be affected; but when the lung has become cedematous or consolidated the percussion will become dull, and the physical signs be the same as those of pleuritic effusion. If, as is usual, the physical signs are most marked at the base, and at the same time the temperature is raised, the case will present the features of a localised empyema.

The temperature is not raised in tumours unless there be some inflammatory complication, *e.g.* pleurisy or consolidation with degeneration of the lung.

It is the elevation of temperature which introduces many of the difficulties into the diagnosis, for the case may then resemble empyema, phthisis, or sub-acute pneumonia.

Expectoration is not constant; indeed, it is often absent until the new growth has involved the actual walls of the air-tubes. It may be absent even when perforation has taken place owing to the obstruction to the air-tubes, unless the perforation be on the tracheal side of the tumour. The sputum may be catarrhal in character, *i.e.* muco-purulent, hæmorrhagic, or contain some of the new growth or fragments of lung-tissue.

Hæmoptysis in any quantity is not common unless the tumour has made its way into one of the large air-tubes, and even then is often absent. Usually it amounts to little more than streaks of blood upon the surface of the muco-purulent sputum, as in chronic bronchitis. It is rarely abundant, but it has in some instances been profuse and fatal.

Walsh¹ states that in cases of cancer of the lung less than one-third escape hæmoptysis altogether.

Newton Pitt² records a case in which several ounces of blood-stained expectoration, on some days almost pure blood, were brought up daily for some months, the patient ultimately dying of exhaustion.

Two cases of fatal hæmoptysis with cancer of the lung are recorded by Walsh and Hoyle.³

In two cases⁴ the sputum has been of a peculiar olive grass-green colour. This is obviously accidental and of no significance, for it is rare with tumour of the lung, and has been met with in other affections, *e.g.* phthisis and pneumonia.

¹ Loc. cit.

² Guy's Hospital Reports, xxxiv.

³ Loc. cit. and Journal of Anatomy and Physiology, July 1883.

⁴ Elliott, Brit. Med. Journ., 1874, April 25. Janssen, Correspbl. f. Schweizer Aertzte, 1885, No. 23.

The sputum may also contain particles of lung tissue or of the new growth itself when a bronchus has been perforated.

In a case of sarcoma of the lung under my own observation, all the tubes of the affected lung were filled with a gelatinous substance of the same nature and appearance as the original tumour, and the patient brought up this substance in considerable quantity during life,

Occasionally the growth is more coherent, so that definite particles of tumour may be brought up.¹

In the most remarkable case recorded by Peacock² an actual cast formed of new growth was expectorated. But even when the growth has made its way into the air-tubes, nothing characteristic may be brought up, owing to the occlusion of the main tubes by the original tumour.

The superficial lymphatic glands sometimes become enlarged. The group of glands most likely to be affected is at the root of the neck above the clavicle, but the enlargement is more often absent than present. Enlarged glands have been also met with in the axilla; rarely with simple intrathoracic tumours, but usually where the walls of the thorax are involved or secondarily to cancer of the breast.

If the tumour, whether in the pleura or the lung, lead to pressure upon the intrathoracic veins, the superficial veins over the corresponding part of the thorax may be dilated.

If the nerves be involved, pain will be caused which may be limited to the seat of pressure, or referred to some distant points in the course of the nerve.

Clubbing of the fingers is stated to occur occasionally by Lebert, but I have not seen it myself, nor do I know of any recorded case to refer to.

DIAGNOSIS.

Many of the difficulties of diagnosis have already been incidentally referred to in discussing the physical signs.

Speaking generally, chest symptoms or physical signs of any kind occurring in a patient who is already the subject of a malignant disease elsewhere, are in most cases correctly referred to secondary growths within the thorax.

When the seat of primary growth is within the thorax, the diagnosis is more difficult. Then the age of the patient, the cachexia, and history of rapid loss of flesh and strength, may suffice to indicate the diagnosis of malignant disease, even when

¹ Cf. Humpel's case, Petersburg. Med. Woch., 1876, No. 40.

² Path. Soc. Trans., xi. 65.

the physical signs and pulmonary symptoms are not sufficient actually to locate it. The diagnosis is still more probable if the physical signs and symptoms are pulmonary, unilateral, and anomalous.

The difficulties of diagnosis are twofold: first, the prime disease may be masked by the complications to which it has given rise; secondly, in the absence of complications the symptoms and physical signs may admit of other and more probable interpretations.

1. Complications on the side of the pleura, *e.g.* pleuritic thickening or pleuritic effusion.

The physical signs and symptoms are those of affection of the pleura, and the difficulty consists in determining the cause of the pleurisy.

This question is sometimes settled by the history, as in the case of osteosarcoma already described, or by some peculiarities in the pleurisy itself. Thus double pleurisy is always suspicious, for it probably depends upon a lesion which can involve both sides, *e.g.* tubercle, or, if not tubercle, probably new growth.

A hæmorrhagic effusion is also suspicious, but it is not conclusive; for in many cases of cancer the effusion is serous and not hæmorrhagic, and when the effusion is hæmorrhagic it is more likely to be due to tubercle than to new growth.

The quantity of blood in such effusions varies greatly. There may not be more than enough to give it a pink colour, or there may be sufficient to make it look almost like pure blood. Strange to say, it is almost always bright in colour, as if the blood had not been long mixed with the serum; but as this cannot usually be the case, we must conclude that the blood in the pleura does not undergo those colour changes so readily as it does in other parts of the body.

The fluid when drawn from the chest may, however, be dark in colour, or even almost black.

Thus, I withdrew an almost black serous fluid, on several occasions, from the pleura of an elderly man affected with malignant disease of the lung or pleura, secondary to malignant disease of the stomach.

Empyema may occur with cancer, but it is rare.

2. The complications in the lung often cause still greater difficulties of diagnosis, *viz.*, œdema, inflammatory consolidation, and breaking down.

Owing to the obstruction to the passage of air through the tubes the voice and breath sounds are deficient, and the signs

are suggestive of effusion, from which the diagnosis is often impossible except by the needle.

Even then the conclusion drawn may be wrong, as in the case I have quoted, where the general conditions seemed to point to an empyema, and when the needle was inserted pus was withdrawn. An incision was made, but only a drachm or two of pus obtained.

The post-mortem showed that there was no empyema, and that the pus had come from a cavity in the base of the lung, the result of secondary changes produced by the new growth at the root.

The rise of temperature associated with many of these complications greatly complicates the diagnosis; for it may lead to the suspicion of empyema (as in the case just mentioned) or of phthisis.

In respect of phthisis, due consideration of the age of the patient and of the history and general character of the disease often enables the correct diagnosis to be made. The examination of the sputum may confirm the conclusion arrived at by the discovery in the one case of the tubercle bacillus, and in the other of portions of growth; but in many cases the diagnosis is a matter of conjecture only, and remains uncertain until the post-mortem examination.

DURATION.

The average duration of malignant disease of the lung is short. In the case of cancer, secondary growths within the thorax are among the latest manifestations of the disease, and life is rarely prolonged beyond a few weeks.

In secondary sarcoma the disease sometimes runs a very rapid course and sometimes a very slow one. Thus, death may occur within a very few weeks of the first onset of symptoms.

In other cases the symptoms may not become serious for a considerable time, as in the cases quoted, in which $2\frac{1}{2}$ years in one case and four years in another elapsed from the removal of the primary tumour.

The duration of primary cancer of the lung and pleura is also short, but it is difficult to determine, owing to the indefinite symptoms of the early stages.

A few months, six to eight months, appears to be the average duration; something, at any rate, considerably under a year. With tumour of the root of the lung, in which the cancer is of the fibrous type and limited to one side, it is quite possible that the duration may be longer, and in some of the cases a history of two or three years' illness is given.

CAUSE OF DEATH.

Death is usually the result of asthenia. Some patients die from hæmoptysis, but this is really rare, and some from other complications rarer still, such as pneumothorax or gangrene of the lung.

Next to asthenia the commonest cause of death is suffocation, but this need not be due directly to the tumour, but rather to the complications which have been produced in the pleura or in the lung.

The onset of grave symptoms, such as cardiac collapse, extreme dyspnœa, and cyanosis, may be very sudden; for it is evident that where a large part of the lung is already occupied by growth, but slight changes in the remainder, such as may be the result of slight congestion or of the collapse produced by even a small effusion, will suffice to give rise to urgent symptoms.

TREATMENT.

The treatment can, of course, be only symptomatic, for there is nothing at present known which has the power of controlling the growth of tumours, and surgical interference is obviously impracticable for many reasons, not the least of which is the uncertainty of diagnosis.

AN ANALYSIS OF
A SECOND SERIES OF FORTY CASES
OF INTUSSUSCEPTION.

BY

W. McADAM ECCLES.

In the volume of the Reports for 1892 (vol. xxviii.) I was enabled, by the kindness of many members of the staff, to publish an analysis of twenty-eight cases of intussusception which had been admitted into the Hospital during the twenty years 1871-1890 inclusive.

As this paper has been somewhat extensively quoted from, especially by Dr. Wiggin of New York, Mr. D'Arcy Power, and Mr. Lockwood, I have made an analysis of the cases which have occurred subsequently, that is, during the six years 1891-1896 inclusive, the number of which amounts to forty.

I have again to thank the physicians and surgeons of the Hospital staff under whose care these cases have been for their renewed permission to use the notes, and for their assistance on many points.

A full table of the cases, with references to the notes, will be found at the end of the paper.

I propose to give a detailed analysis of the cases, under the same headings as in my former analysis.

1. *Sex of the Patients.*—Of the 40 cases, 26 occurred in males and 14 in females. This again bears out the fact that intussusception is more frequent in males than in females. With the 28 of the former series, it will be seen that in the total of 68 cases 43 were males and 25 females.

2. *Age of the Patients.*—No less than 27 out of the 40 cases were under the age of 12 months, one was 13 months old, 8 were between 2 and 5 years of age, one was between 5 and 10 years old, and 2 were 12 years, and one 30 years of age,

this being the oldest patient, the youngest being a boy aged 4 weeks.

Taking the 28 cases recorded before as well, 45 out of the 60 cases were below one year of age, or 75 per cent. of all cases of intussusception occur at this early period of life.

3. *Causes of the Affection.*—As in the former analysis, the notes give no precise indication of any definite causes of the disease. There is again a marked absence of any clear history of previous gastric or intestinal trouble.

The patients are usually stated to have been in good health up to the time the symptoms appeared, and that these commenced suddenly. In one case, that of a woman aged 30 (No. 3), a polypus was found growing from the intestinal wall at the site of the beginning of the invagination.

3a. *Variety of Intussusception.*—By far the larger number of the cases seemed to have been, or were shown to be, of the ileo-cæcal variety. Three, however, consisted entirely of small intestine (enteric variety, Nos. 3, 35, and 36), one of the ileocolic form (No. 17), and one of colon wholly (colic variety, No. 33).

4. *Duration of Symptoms before Admission, and Mortality.*—Of the 40 cases, 21 recovered and 19 died; of the 28 cases in the former series, only 9 lived while 19 died. It will thus be seen that early diagnosis and prompt treatment is already beginning to have a decided bearing on improvement in the final results.

Within the *first twenty-four hours* after onset of symptoms 20 cases were admitted, of whom 11 recovered and 9 died—that is to say, of all the cases which lived, more than half were admitted on the first day of the disease.

It is interesting to note that whereas in the former analysis out of 28 cases only *one* was admitted on the first day, in this second series of 40 no less than 20, or half, of the cases were brought up to the Hospital within the first twenty-four hours.

After the first twenty-four hours, but within the *first forty-eight hours*, 5 cases were admitted, of whom 3 lived and 2 succumbed.

On the *third day* 4 were received, of whom 3 died and only 1 recovered. In the first analysis this was the day on which the largest number of cases was admitted, namely, 8, and only 2 of these lived.

On the *fourth day* 5 cases were brought, of whom 3 died and 2 recovered.

On the *fifth day* 3 cases were admitted, of whom 2 died and

1 survived, and this (No. 24) was a very doubtful case of intussusception.

Two cases in addition were admitted, but the notes being mislaid, it is unknown how long the symptoms had been in evidence. Both these patients recovered.

No case in this second series recovered after sloughing and separation of the intussusception—such a circumstance having never occurred in any case—but it will be remembered that there was one instance of this in the former series. Thus such a result has happened once in 68 cases, which shows its great rarity.

5. *Symptoms and Signs.*—Twenty-six cases presented the three cardinal symptoms or signs of abdominal pain, vomiting, and the passage of blood and mucus per rectum. Five cases had the vomiting and blood-stained mucus, while three had abdominal pain and vomiting only, and two blood-stained mucus as the sole representative of the three; and one had abdominal pain and blood-stained mucus.

It will thus be seen that no less than 34 out of the 40 cases had the most important and characteristic sign of blood-stained mucus being voided from the bowel. Of the remaining cases, in two there was absolute constipation, while in two it is not recorded whether the bowels were moved, but it is stated that no blood was passed per rectum. The notes of the two last cases are missing.

The occurrence of a definite tumour, caused by the invaginated bowel and its sheath, to be felt through the abdominal wall and per rectum, was observed no less than eleven times. In 20 other cases it was felt in the abdomen only, while in one other case it was discovered only per rectum. Thus in 32 cases out of 40 a tumour was made out. In the first series 18 out of 28 cases presented a tumour; therefore, of the 68, as many as 50, or 83.3 per cent., had a tumour which could be palpated.

It is very interesting to observe the following facts:—In 6 out of the 11 cases in which the tumour was found per rectum as well as per abdomen, the tumour itself is stated to have been on the *left* side of the abdomen, and only twice on the right; and again in the 20 cases where it was felt only in the abdomen, in no less than 6 cases it was definitely found on the *left* side, and in 3 transversely.

Moreover, in several of the cases the swelling could not be evidently palpated until the patient was placed under the influence of chloroform, a fact which emphasises the truth that it is always better to examine with the help of an anæsthetic.

In only five cases is it actually stated that no tumour could be felt either per abdomen or per rectum; and in one it is not stated whether any swelling was discovered, while in the remaining two the notes are missing.

6. *Treatment.*—This will be reviewed under four headings:—

(1.) That of leaving the patient without any active interference whatsoever. This occurred in three cases. In two cases (Nos. 20 and 24) recovery followed, but the diagnosis is uncertain in both, particularly the former. The third case (No. 33) died, and a purely colic intussusception was found on post-mortem examination, but had not given rise to clear evidence of its existence before death.

(2.) That of external manipulation alone through the abdominal wall. This was apparently the successful cause of the reduction in one case (No. 26), though the manipulation was not undertaken with this intention, but was performed by a number of observers who were desirous of feeling the distinct tumour through the abdominal wall.

It is, however, probably very rare that simple massage or kneading of the swelling per abdomen is likely to produce a satisfactory reduction, and no reliance should be placed upon this method of procedure.

(3.) That of attempting to reduce the invaginated gut by means of the distension of the bowel below the intussusception either with liquid or gas, combined in most cases with manipulation of the swelling through the abdominal wall.

This treatment employed *alone* was successful in nine cases. Injection of fluid alone gave good results in five cases, inflation alone in three cases, and inflation followed by an injection in one case.

In six of these successful cases the injection or inflation was undertaken while chloroform was being used, in two the notes do not state whether an anæsthetic was used or not, while in the remaining case chloroform was not used.

The injection or inflation had to be repeated in six cases, and in three only was the inflation or injection successful. In case No. 21 injection was used no less than four times before a satisfactory result was obtained. In seven cases the patients were under 12 months of age, one case was aged $6\frac{1}{2}$ years, and one $2\frac{1}{2}$ years.

The treatment by inflation when used alone failed to bring about a final and complete reduction in one case (No. 8). It failed to reduce, or the reduction was followed by a reappearance of the tumour, which necessitated laparotomy in thirteen cases; that is, inflation in two cases and injection in eleven.

With regard to this method of treatment, there is no doubt that, given an early case, it will be most efficacious if carried out with the child under chloroform; but if there is the slightest doubt as to complete reduction, an exploratory laparotomy should not be delayed an hour; in fact, it is always well to have every preparation for opening the abdomen made prior to an attempt at reduction either by injection or inflation.

It would seem from the thirteen cases in which the tumour reappeared after apparent reduction by injection or inflation, that either reduction was complete and that a fresh intussusception was afterwards formed, or, what is to my mind much more likely to be the true state of matters, that the last portion of an ileo-cæcal invagination has remained unreduced, but being so small in amount, it has escaped detection by external palpation.

Given that the valve is never really reduced, it is easy to see how the whole tumour may very rapidly reappear. Laparotomy and post-mortem examination both bear out the fact that it is probably in the majority of cases the correct explanation of the recurrence of the trouble.

iii. That of performing abdominal section and reducing the intussusception, or, if this be impossible, of excising it and making an intestinal anastomosis, or of making an artificial anus above the obstruction.

Laparotomy, as the primary treatment, was undertaken in eleven cases, of which seven terminated fatally and four recovered. Of the seven fatal cases, the duration of symptoms before operation was respectively:—24 hours, 3 days, 4 days, 6 hours, 2 days, 18 hours, 3 days. It will be noticed that four of these seven may be considered to be late cases, and the condition found in them, that of gangrene of the invaginated portion, proves this, and militated much against a successful result. In the first case of the seven, the intussusception was easily reduced, but the child died a few hours after operation, the temperature having risen to 105.8° F. In another, the invagination was not discovered at the operation, and the child died unrelieved; and in the other too much difficulty was experienced in bringing about reduction.

Laparotomy was performed after an attempt or attempts had been made by injection or inflation to reduce the intussusception, and had either failed entirely or the tumour had reappeared after apparent reduction, in fourteen cases, of which ten were fatal and four successful.

Of the fatal cases, in the first the intussusception was not discovered at the operation and the child died unrelieved. In

the second, gangrene was found, the patient being a woman aged 30 years. In the third, the operation was very difficult, and somewhat prolonged owing to the chloroform being taken very badly. In the next case (No. 12), a boy aged $3\frac{1}{2}$ years, lived after the abdominal section with all the symptoms produced by the intussusception relieved for eight days. He then developed intestinal obstruction owing to a kinking of a piece of adherent bowel. He died after a second laparotomy. This case therefore is perhaps one which should not be included among the fatal ones after laparotomy for intussusception. In another case, where the symptoms had been in evidence for four days, a female infant succumbed after an excision of an irreducible intussusception and the formation of an artificial anus. The following case was of a similar nature, and in the one after it the child died of shock. In two others the intussusception was irreducible, and in the last again not found.

Altogether, then, 25 cases had abdominal section performed, out of which 17 died and 8 recovered.

In the previous series of 28 cases, 13 cases were submitted to laparotomy, and out of these 11 died and only 2 recovered. The results, therefore, of the second series show a decided improvement.

Briefly, the treatment employed and its result in the 40 cases under review was the following:—

I. *Three* cases were left without active treatment; of these *two* recovered and *one* died.

II. *One* had merely external manipulation through the abdominal walls, and it lived.

III. (*a.*) *Four* had inflation alone performed; three survived and one succumbed.

(*b.*) *Five* had injection only, each one followed by a satisfactory result.

(*c.*) *One* had inflation, succeeded by injection, which succeeded in reducing the bowel.

(*d.*) *Eleven* had injection alone, followed subsequently by laparotomy, seven dying and four living.

(*e.*) *Two* had inflation alone, followed by laparotomy, and both died.

(*f.*) *One* had inflation and then injection, and this followed by laparotomy with a fatal result.

IV. *Eleven* had laparotomy performed primarily, that is, without previous treatment by injection or inflation, and seven died and three recovered.

The remaining case is without detailed notes, but the result was that of recovery.

The conclusions arrived at from the previous analysis of 28 cases are emphasised by the facts evinced by the analysis just completed.

Early diagnosis is of the utmost importance, and any child presenting one or both of the most important signs or symptoms of intussusception, namely, the passage of blood-stained mucus per rectum, and the presence of a tumour felt per abdomen or per rectum, should at once be treated as if it were a case of invaginated bowel. If seen early, a trial of injection of liquid under chloroform should be made in cases presenting a definite tumour, followed by *immediate* laparotomy if the tumour remain unreduced, or if there is uncertainty as to its reduction.

Laparotomy as a primary treatment is to be undertaken in cases where a definite tumour is not discovered, but where symptoms are sufficiently suspicious to make intussusception likely, and it is to be undertaken when the case is a late one, or where injection or inflation has failed.

I venture to think the above analysis tends to prove that intussusception in the last few years is being more accurately diagnosed, and that in its all-important early stages; that its treatment is more prompt, and that the results are greatly better.

Still the condition is one of most grave moment, and its death-rate is all too high, but it is to be hoped that this will be still further considerably diminished in years shortly to come.

I have refrained from including in this analysis any cases but those which have occurred within the wards of St. Bartholomew's Hospital, but other statistics which have been published elsewhere all go to prove the truthfulness of the above conclusions.

FORTY CASES

No. of Case.	Year.	Physician or Surgeon.	Sex.	Age.	Duration of Disease on Admission.	Symptoms.
1.	1891.	Dr. Church, Mr. Butlin.	F.	4 mos.	18 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen in <i>left</i> loin, and per rectum.
2.	1891.	Sir T. Smith.	F.	8 mos.	? 24 hours.	Blood-stained mucus per rectum. Tumour felt per abdomen and per rectum.
3.	1891.	Sir T. Smith.	F.	30 yrs.	3 days.	Abdominal pain. Vomiting. <i>No</i> hæmorrhage per rectum. <i>No</i> tumour felt per abdomen or rectum.
4.	1891.	Mr. Willett.	M.	5 mos.	3 days.	Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen and per rectum.
5.	1891.	Mr. Willett.	M.	5 mos.	5½ hours.	Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen and per rectum.
6.	1891.	Mr. Bruce Clarke.	M.	13 mos.	24 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum.
7.	1892.	Mr. Bruce Clarke.	F.	5 mos.	24 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour per abdomen in region of descending colon and per rectum.
8.	1892.	Mr. Butlin.	F.	4 mos.	5 days.	Vomiting. Blood-stained mucus per rectum. <i>No</i> tumour felt per abdomen or per rectum.
9.	1892.	Mr. Bruce Clarke.	M.	6 mos.	12 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt in <i>left</i> iliac fossa and per rectum.
10.	1892.	Mr. Bowlby.	M.	4 mos.	36 hours.	Vomiting. Abdominal pain. Blood-stained mucus per rectum. Tumour felt in <i>left</i> side per abdomen and per rectum.
11.	1892.	Mr. Baker.	M.	2½ yrs.	...	.....

OF INTUSSUSCEPTION.

Treatment.	Result.	Remarks.	Reference.
<i>Inflation</i> on second day. Tumour disappeared, but felt again soon after. <i>Laparotomy</i> on second day. Intussusception not found.	Death.	A good deal of previous constipation. No post-mortem.	Faith, 134.
<i>Inflation</i> with air, and external manipulation under chloroform. Reduction.	Recovery.	An early case with good result.	Female, ii. 1662.
<i>Injection</i> of two pints of oil on third day. <i>Laparotomy</i> on fourth day. 5-inch intussusception. Gangrene. Artificial anus.	Death.	A purely <i>enteric</i> intussusception, two feet above valve. Polypus found in bowel.	Female, ii. 2092, Museum Specimen, No. 2191C.
<i>Inflation</i> with air under chloroform.	Recovery.	A rather late case, but with good result.	Male, iii. 1599.
<i>Inflation</i> with air under chloroform. Reduction. Return of tumour. <i>Inflation</i> again; no return.	Recovery.	This was the same patient as No. 4. Re-admitted with same symptoms.	Male, iii. 1661.
<i>Laparotomy</i> on second day. Intussusception reduced easily.	Death.	Temperature rose to 103°-8° F. before death, a few hours after operation. <i>P.M.</i> Nothing abnormal.	Male, v. 2267.
<i>Injection</i> of water. Reduced. No return of intussusception.	Recovery.	This patient, nine days before admission into St. Barth. Hosp., had had similar symptoms, and had been taken to Paddington Green Children's Hospital.	Female, v. 391.
<i>Inflation</i> on fifth day with air under chloroform. Apparent reduction. Reappeared three days later, and child died.	Death.	Apparently, not a very acute case. <i>P.M.</i> No difficulty in reducing intussusception. No peritonitis.	Female, v. 1094.
<i>Injection</i> on first day with hot milk. Apparently reduced. <i>Laparotomy</i> on second day. Intussusception easily reduced.	Recovery.	Opium was given freely after operation.	Male, iii. 2265.
<i>Injection</i> on second day of hot water under chloroform. No result. <i>Laparotomy</i> immediately; some difficulty in reducing gut.	Death.	Considerable difficulty during operation owing to chloroform being taken badly.	Male, iv. 911.
.....	Recovery.	Notes of case missing.	Male, v. 533.

FORTY CASES OF

No. of Case.	Year.	Physician or Surgeon.	Sex.	Age.	Duration of Disease on Admission.	Symptoms.
12.	1892.	Dr. Church, Mr. Harrison Cripps.	M.	3½ yrs.	46 hours.	Abdominal pain. Vomiting. Diarrhoea; no blood at first. Tumour felt on <i>right</i> side of abdomen and per rectum.
13.	1893.	Mr. Bowlby.	F.	9 mos.	6 hours.	Abdominal pain. Blood-stained mucus per rectum. Tumour felt per abdomen to <i>left</i> of umbilicus and per rectum.
14.	1893.	Mr. Marsh.	F.	9 mos.	8 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen on <i>right</i> side above umbilicus.
15.	1893.	Mr. Butlin.	F.	6 mos.	3 days.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen in <i>left</i> iliac fossa.
16.	1893.	Mr. Bruce Clarke.	M.	7 mos.	4 days.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen in <i>left</i> iliac region. Not felt per rectum.
17.	1893.	Mr. Lockwood.	M.	8 mos.	30 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen in <i>right</i> iliac fossa, but not per rectum.
18.	1893.	Dr. Church, Mr. Willett.	F.	4 years.	2 days.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen transversely across above umbilicus. Not felt per rectum.
19.	1893.	Dr. Church, Sir T. Smith.	M.	9 mos.	24 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour not felt on admission. Under chloroform tumour felt indistinctly high up in <i>right</i> side of abdomen.
20.	1894.	Mr. Langton.	F.	6 mos.	30 hours.	Vomiting. Slight amount of blood per rectum. <i>No</i> tumour felt.

INTUSSUSCEPTION—Continued.

Treatment.	Result.	Remarks.	Reference.
<i>Inflation</i> on third day with air under chloroform. Tumour partially disappeared, but still felt under liver. <i>Laparotomy</i> four hours later. 8-inch intussusception, easily reduced, except the last inch.	Death.	The symptoms were not very acute. The child did well foreight days, then had pain in abdomen. Intestinal obstruction supervened, and a second <i>laparotomy</i> was performed fourteen days after first. A piece of small intestine was found adherent and kinked.	Faith, 178.
<i>Injection</i> on first day of water. Apparent reduction. Tumour reappeared next day. <i>Injection</i> again on second day. Reduction.	Recovery.	An early case. Probably not complete reduction at first. Good result in the end.	Female, iv. 1712.
<i>Laparotomy</i> on first day. Intussusception easily reduced.	Recovery.	An early case, with a good result. Temperature rose to 102° F. after operation.	Female, iv. 2141.
<i>Laparotomy</i> on third day. Gangrene of bowel. Resection, with suturing of ends.	Death.	A late case. Died three hours after operation. P.M. No peritonitis. Sutured intestine water-tight.	Female, v. 1250.
<i>Laparotomy</i> on fourth day in left linea semilunaris. Intussusception irreducible. Gangrene. Resection; ends sutured together.	Death.	A late case. Death two hours after operation.	Male, iii. 2137.
<i>Injection</i> on second day of water under chloroform. No reduction. <i>Laparotomy</i> immediately in right linea semilunaris. Intussusception easily reduced.	Recovery.	A fairly early case. <i>Ileo-colic</i> variety.	Male, v. 873.
<i>Injection</i> on second day. Tumour said to have disappeared. Reappeared three days later. <i>Manipulation</i> under chloroform said to have reduced it. Tumour reappeared soon after. <i>Laparotomy</i> on second day after reappearance. Intussusception reduced easily, except last inch.	Recovery.	A sub-acute case. The recurrence of the tumour points probably to incomplete reduction. Cystitis occurred during convalescence.	Faith, 30.
<i>Laparotomy</i> on second day. A very small intussusception, easily reduced.	Recovery.	The advantage of an anæsthetic in diagnosis is well seen in this case.	Faith, 182.
Rest in bed.	Recovery.	A very doubtful case of intussusception.	Female, iii. 68.

No. of Case.	Year.	Physician or Surgeon.	Sex.	Age.	Duration of Disease on Admission.	Symptoms.
21.	1894.	Mr. Butlin.	F.	7 mos.	4 days.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour easily felt per abdomen in <i>right</i> iliac fossa under chloroform and per rectum.
22.	1894.	Mr. Langton.	M.	5 mos.	6 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen on <i>right</i> side, but not per rectum.
23.	1894.	Mr. Marsb, Sir Dyce Duckworth.	M.	7 mos.	2 days.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen on the <i>right</i> side at the lower part, very distinct under chloroform, but not felt per rectum.
24.	1894.	Mr. Marsh.	M.	4 wks.	5 days.	Abdominal pain. Vomiting. <i>No</i> blood or mucus per rectum. Under chloroform tumour felt in <i>right</i> iliac fossa. <i>Nothing</i> felt per rectum. Patient passed healthy motion during examination.
25.	1894.	Mr. Butlin.	M.	6½ years.	15 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen, at the level of and to the <i>right</i> of umbilicus.
26.	1894.	Sir Dyce Duckworth.	M.	3 years.	6 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen in its upper half between umbilicus and ribs, but not felt per rectum.
27.	1894.	Dr. Brunton, Mr. Wals- ham.	F.	9 wks.	18 hours.	<i>No</i> apparent abdominal pain. <i>No</i> vomiting. Blood-stained mucus per rectum. <i>No</i> tumour felt per abdomen or per rectum at first. Thirty hours later a tumour was felt per abdomen.
28.	1895.	Mr. Willett.	F.	2½ years.	12 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen in region of splenic flexure.

INTUSSUSCEPTION—Continued.

Treatment.	Result.	Remarks.	Reference.
<p><i>Injection</i> on fourth day of 10 oz. of water under chloroform with Higginson's syringe. Tumour said to be reduced. Reappeared a few hours later. <i>Injection</i> again effectual. Reappeared again. <i>Injection</i> once more; again reduced, but reappeared shortly after. <i>Injection</i> for the fourth time. Reduced and remained so.</p>	<p>Recovery.</p>	<p>A late case, and yet reduced by injections. Illustrates well the liability to recurrence after supposed reduction. It is possible the last portion was never completely reduced.</p>	<p>Female, v. 2315.</p>
<p><i>Laparotomy</i> on first day. No intussusception found. Abdominal lymphatic glands enlarged.</p>	<p>Death.</p>	<p><i>P.M.</i> lying in the upper and left-hand part of the abdomen, under the stomach, was an intussusception about five inches long. Reduction easily effected.</p>	<p>Male, iii. 1975.</p>
<p><i>Injection</i> on second day of 8 oz. of warm milk without chloroform. Tumour <i>not</i> reduced. <i>Injection</i> of 20 oz. under chloroform, by hydrostatic pressure of 2½ feet, quite effectual.</p>	<p>Recovery.</p>	<p>The advantages of chloroform both in diagnosis and treatment are well shown in this case.</p>	<p>Male, iii. 2727.</p>
<p>Rest in bed.</p>	<p>Recovery.</p>	<p>A very doubtful case of intussusception.</p>	<p>Male, iv. 2769.</p>
<p><i>Inflation</i> on the first day. Failed to reduce. <i>Injection</i> of hot water by syringe under chloroform.</p>	<p>Recovery.</p>	<p>An early case, but acute, with excellent results.</p>	<p>Male, v. 1883.</p>
<p><i>Manipulation</i> of the abdomen was performed by many observers with a view of feeling the definite tumour, and apparently this reduced the intussusception.</p>	<p>Recovery.</p>	<p>A very interesting case, early in its history, but with acute symptoms. The manipulation was borne without pain.</p>	<p>Elizabeth, 138.</p>
<p><i>Laparotomy</i> on second day, thirty hours after admission. Six inches of intussusception reduced, but the colon was ruptured in so doing.</p>	<p>Death.</p>	<p><i>P.M.</i> No peritonitis, and the portion of small intestine did not look as if it had been gripped for forty-eight hours.</p>	<p>Faith, 166.</p>
<p><i>Injection</i> on first day of water without chloroform. Some uncertainty as to reduction. Child was then placed under chloroform, but no tumour detected.</p>	<p>Recovery.</p>	<p>An early case. The value of anæsthetic clearly shown.</p>	<p>Female, ii. 2752.</p>

FORTY CASES OF

No. of Case.	Year.	Physician or Surgeon.	Sex.	Age.	Duration of Disease on Admission.	Symptoms.
29.	1895.	Mr. Marsh.	F.	4 mos.	4 days.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour <i>not</i> felt per abdomen, but felt per rectum.
30.	1895.	Sir T. Smith, Dr. Church.	M.	4 mos.	24 hours.	Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen on <i>left</i> side of abdomen and per rectum.
31.	1895.	Mr. Walsham.	M.	10 wks.	18 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. <i>No</i> tumour to be felt per abdomen or per rectum even under chloroform.
32.	1895.	Mr. Willett.	M.	6 mos.	22 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen across the upper part, and down to <i>left</i> iliac region, but not felt per rectum.
33.	1895.	Mr. Willett.	M.	6 mos.	4 days.	Abdominal pain. Vomiting. Blood and mucus per rectum on second day. Bowels not open since. <i>No</i> tumour felt per abdomen or per rectum even under chloroform.
34.	1895.	Mr. Langton.	M.	3½ years.	12 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen in <i>left</i> iliac fossa.

INTUSSUSCEPTION—Continued.

Treatment.	Result.	Remarks.	Reference.
<i>Injection</i> on fourth day with water. Failure to reduce the tumour from rectum. <i>Laparotomy</i> on fourth day, when it was found impossible to reduce the gut. It was excised, and an artificial anus made.	Death.	A late case. Much difficulty was experienced at laparotomy in returning small intestines into abdomen.	Female, iv. 2799.
<i>Injection</i> on first day with water under chloroform. Reduced, but reappeared next day. <i>Injection</i> on second day; again reduced, but reappeared next day but one. <i>Injection</i> on fourth day, but not reducible. <i>Laparotomy</i> on fourth day. Intussusception irreducible, and therefore artificial anus made.	Death.	The repeated reappearance of the tumour tends to show that it was never really completely reduced by the injections.	Male, i. 1908.
<i>Laparotomy</i> on first day. Intussusception reduced with some difficulty.	Death.	An early but very acute case in a very young subject.	Male, i. 2490.
<i>Injection</i> on first day with soap and water; no effect. <i>Inflation</i> then with air; no effect. <i>Injection</i> again with oil; no effect. <i>Laparotomy</i> on second day. Intussusception fairly easily reduced.	Death.	<i>P.M.</i> The mesenteric lymphatic glands were markedly enlarged.	Male, ii. 1150.
<i>No operative procedure</i> , as diagnosis so uncertain.	Death.	<i>P.M.</i> An unreduced intussusception in right lumbar region. Reduced with much difficulty. It was purely colic. An interesting case without any well-marked symptoms, and therefore very difficult of diagnosis.	Male, ii. 1173.
<i>Injection</i> on first day of 15 oz. of milk and water by 2½ feet of hydrostatic pressure under chloroform. Reduced, but reappeared eight hours later. <i>Injection</i> again on second day under chloroform. Again reduced, but soon returned. <i>Laparotomy</i> on second day, when a portion of gut was found inflamed and ecchymosed, and it was therefore thought to be reduced intussusception.	Death.	<i>P.M.</i> An intussusception 3½ inches long was found lying over the lumbar spine. Reduced with some difficulty, especially the last portion. It is questionable whether the injections ever completely reduced the intussusception.	Male, iii. 1533.

FORTY CASES OF

No. of Case.	Year.	Physician or Surgeon.	Sex.	Age.	Duration of Disease on Admission.	Symptoms.
35.	1895.	Mr. Langton.	M.	12 years.	3 days.	Abdominal pain. Vomiting. No blood or mucus per rectum, the bowels being confined altogether. Tumour felt per abdomen in the <i>right</i> side.
36.	1895.	Mr. Butlin.	M.	12 years.	4 days.	Abdominal pain. Vomiting. Bowels not opened. A softish swelling could be felt to the <i>right</i> side near the edge of rectum.
37.	1896.	Sir T. Smith.	M.	2 years 8 mos.	8 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen on <i>right</i> side below umbilicus.
38.	1896.	Sir T. Smith.	M.	4 mos.	9 hours.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen in epigastrium.
39.	1896.	Dr. Hensley, Mr. Marsh.	M.	6 mos.	?? 3 weeks. ? 5 days.	Abdominal pain. Vomiting. Blood-stained mucus per rectum. Tumour felt per abdomen in umbilical and <i>left</i> iliac regions, and also felt per rectum.
40.	1892.	Dr. Church.	M.	2 years 2 mos.	...	Notes of case missing.

INTUSSUSCEPTION—Continued.

Treatment.	Result.	Remarks.	Reference.
<i>Laparotomy</i> on third day; gangrene of intussuscepted portion. Resection. Anastomosis by Murphy's button.	Death.	A <i>purely enteric</i> intussusception. Patient died four days after operation. <i>P.M.</i> Intestinal matter found in <i>right</i> iliac fossa. No general peritonitis. Intestine at site of anastomosis found in a state bordering on gangrene. There was a duodenal ulcer which had perforated and had probably been the immediate cause of death.	Male, iii. 3491.
<i>Laparotomy</i> on fourth day. Three distinct intussusceptions found. All easily reduced. Bowels were not opened till six days after operation.	Recovery.	Another <i>purely enteric</i> case. A very interesting companion with Case No. 35.	Male, v. 2096.
<i>Injection</i> on first day of water under chloroform. No reduction. <i>Laparotomy</i> on first day. Some difficulty in bringing intussusception to the surface, but it was easily reduced.	Recovery.	An early case of older age than is usual, with a good result.	Male, i. 1365.
<i>Injection</i> on first day of milk under chloroform. No reduction. <i>Laparotomy</i> on first day. Intussusception could not be reduced, and patient too collapsed for resection.	Death.	An early case, but an acute one in a young child, with fatal result. Compare Case No. 37.	Male, i. 2185.
<i>Injection</i> with warm oil without chloroform. No avail. <i>Injection</i> with milk and water under chloroform. ? Reduction. <i>Laparotomy</i> the day after injections. Intussusception fairly easily reduced.	Death.	<i>P.M.</i> A two-inch ileo-cæcal intussusception found unreduced, but it did not seem to have been invaginated for long. The history somewhat points to a chronic intussusception. It is doubtful whether injection caused reduction.	Surgical Male Register, iv. 1023; also Medical Male Register, iv. 89.
<i>Laparotomy.</i>	Recovery.

ON THE RELATIVE DIGESTIBILITY OF WHITE AND BROWN BREAD.

BY

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Medical men are often questioned by their patients, or their patients' friends, as regards the relative merits of white and brown bread. Accurate information upon this point is not so easy to get as would perhaps at first sight appear. Owing to the enterprise of bread companies of one kind or another, literature upon the subject is ample enough. Absolute value, however, seems to change sides, invariably ranging itself on the side of the particular bread company's bread from which the literature we happen to be reading at the time emanated. Under these circumstances we thought that a short discussion of the matter would not be either without interest or use.

First of all, it will be well to inquire what is the difference between white and brown bread? But before doing this, we might just notice very briefly what distinguishes leavened from aërated bread. This subject had better be considered first, because it is obvious that both white and brown bread can be leavened or aërated. The leavening of bread is performed by various methods, differing in details into which we need not enter, but consists essentially in mixing yeast with the dough. The yeast is, however, never pure, *i.e.* never contains only *saccharomyces cerevisiæ*, but mostly at the present time contains also organisms causing acetic acid and lactic acid fermentation. For this reason a watery infusion of leavened bread always presents a marked acid reaction. *Ex nihilo nihil fit*; in other words, yeast does not produce a fine spongy bread for nothing. The alcohol and carbonic acid gas formed by it is formed at the expense of the sugar in the dough.

Sugar is a very important nutrient constituent of bread, hence a loss of sugar diminishes the nutritive value of the bread in question. From 1 to 2 per cent. of the sugar contained in the dough is used up in bread averagely leavened in this manner. Most of the sugar thus converted is produced from starch; hence we can express this loss in terms of dough. One of the earliest scientists to appreciate this fact was the chemist Liebig, who calculated that by using yeast to raise bread, an amount of bread was wasted in Germany alone sufficient to supply 40,000 men. The result of this observation was the invention by Liebig of a baking-powder known as the Horsford-Liebig baking-powder. This consisted of acid phosphate of calcium and carbonate of soda. When this powder was mixed with the dough and the whole warmed, the acid phosphate decomposed the carbonate of soda, carbonic acid was evolved, and the bubbles of this gas escaping during the baking process rendered the bread spongy. Numerous other methods of aërating bread without yeast have been invented since the time of Liebig. The one perhaps best known in this country is the so-called Daughlish system, in which the flour is mixed under high pressure with water supersaturated with carbonic acid gas; the dough, upon being taken out of the vessels, rises, and is quickly baked.

The superiority, from a dietetic standpoint, of a well-raised bread as compared with a badly raised, is simply due to the fact that evolution of the carbonic acid gas takes place to a greater extent than we see. When one looks at a sample of bread, one is apt only to notice the big holes which are dotted over its cut surface, and to overlook the actual structure of the bread, which should be reticulate. In short, the carbonic acid gas makes, in its effort to reach the surface, a—so to speak—canalicular system throughout the loaf. When well-raised bread is taken into the mouth or stomach, this permeability which it possesses renders it much more easily accessible to the saliva or gastric juice, since the latter, by traversing the canaliculi formed during the process of raising, can get quickly to the remotest parts of any given lump of bread. In the case of a lump of solid dough, such as Yorkshire pudding, the digestive juices can only reach its remotest parts by osmosing through its substance, and this is a much slower business. As a rule, white bread is much better raised, *i.e.* has a much more reticular structure, than brown, and, as we shall see later on, the saliva acts much more quickly on the starch contained in white bread than on that in brown. We can now return to the difference between white and brown bread.

There are breads of varying degrees of whiteness and varying degrees of brownness; for the purposes of our research we took the extremes of the two classes. For white bread, we bought the best white bread of a West-End baker; for brown bread, we employed whole-meal bread. White bread is made from flour which is derived from the central part of wheat granule; this yields both the whitest and the finest flour. Whole-meal bread is made from a flour which is not sorted, but derived from the whole of the wheat granule. The chemical composition of the wheat granule is not uniform from its centre to its husk. From this it follows that white flour, and hence white bread, does not contain those substances which are present in the peripheral layers and husk of the wheat granule. Chemically, the chief substances in which white bread is deficient as compared with brown are ash (consisting mostly of phosphates of potash, lime, and soda), nitrogenous matters, fatty matters, and cellulose. The composition of bread of course always differs quantitatively, according to the grain employed in making the flour, independently of, as well as according to the kind, coarse or fine, used; and hence the breads of northern countries differ somewhat from those of southern countries, in that, in the latter case, the excess of sun has an effect on the metabolic processes of the wheat or rye plant, as the case may be. Into this question it would be beside our purpose here to enter. To show the difference in chemical composition between white and brown breads, we cannot do better than give the following table:—

TABLE I.—Percentage Composition of Various Breads.¹

Kind of Bread.	Water.	Nitrogenous Substances.	Fat.	Sugar.	Nitrogenous Free Extract.	Cellulose.	Ash.
Coarse white bread . .	39.95	7.58	0.10	4.47	50.47	0.33	1.20
Bosnian white bread . .	53.72	6.59	0.33	2.00	34.97	0.78	1.59
Wheaten bread (small roll) }	29.52	8.69	0.21	3.77	56.29	0.35	1.17
Vienna rye-bread . . .	31.91	8.30	0.33	1.46	55.11	0.97	1.90
Pumpernickel	42.90	8.90	2.09	3.28	39.74	1.79	1.29

Of the breads given above, an extreme instance of brown bread is afforded by “pumpernickel,” an almost black bread.

¹ These figures are derived from König's “Lehrbuch der Chemie der menschlichen Nahrungs- und Genussmittel.”

which is eaten in Northern Germany, and which perhaps is only known to the tourist as being, in Berlin and the Rhenish provinces, invariably served with cheese in thinnish oblong pieces.

In the case of the two examples of bread which we used for our experiments, rather a more exhaustive analysis was necessary than that contained in Table I. For this analysis we are indebted to Drs. Schidrowitz and Rosenheim. To make the quantities of the different constituents more comparable, the results of the analysis are given in two forms—(1) as simple results, (2) calculated to water-free breads, *i.e.* allowance is made for the different amounts of water in the breads.

TABLE II.

	Percentage Composition of			
	Breads as Supplied.		Water-Free Breads.	
	White Bread.	Brown Bread.	White Bread.	Brown Bread.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Water	39.10	40.18	...	...
Dry substance	60.90	59.82	...	...
Total ash	0.59	1.88	0.97	3.14
Phosphoric acid	0.16	0.51	0.26	0.85
Soluble matter	4.73	7.54	7.77	12.60
Nitrogen	1.32	1.25	2.17	2.09
Albumen, calculated from nitrogen	8.25	7.87	13.54	13.15
Pure albumen	7.34	7.86	12.05	13.15
Soluble nitrogenous matter	0.61	0.73	1.00	1.22
Starch and saccharine matters, &c.	51.85	49.44	...	...
Starch	38.45	39.18	63.13	65.49
Sugar (maltose)	1.19	1.77	1.95	2.96
Dextrin	0.84	0.71	1.38	1.19
Cellulose	0.24	1.06	0.39	1.68
Fat	0.21	0.63	0.34	1.05
Acidity (lactic acid)	0.19	0.29	...	...
Loss of water in fifteen days	9.23	...	...	...

If we study the above tables, we shall see that brown bread differs from white in containing more fat, more salts, more water, and more cellulose. The amount of nitrogenous matter is, as a rule, more also in brown bread, but the difference is small.

Before leaving this, the chemical part of our subject, and entering upon the physiological one, we will briefly describe the microscopical differences between white and brown bread.

For this purpose the breads were made into a thin paste with

water and dilute caustic potash, and a film of this was examined under a low power (1 inch). In the white bread the outlines of the starch granules were found to be distinct, although the striation could not be seen. In the brown bread, on the other hand, the outlines were very much more blurred. This is very probably due to the fact that the crust of the brown bread is much less porous than the crust of the white. From this it follows that the steam generated in the loaf during baking, having less easy vent in the brown than in the white bread, is under greater pressure, and so becomes superheated. Hence the starch granules in the brown bread are much more disintegrated than in the white. This means that during baking the contents of a brown loaf are submitted to not only more steam, but steam at a higher pressure than the contents of a white loaf.

The mere chemical composition of any food stuff is a very poor index of its nutritive value. A stick of charcoal, the atmospheric air, a little water, and some sea-salt contain all the elements of a typical diet, and in ample quantity; but the nutritive value of this composition is practically nil; hence it is not always a matter of what a food-stuff contains, but how it contains it. So long as a food remains in the alimentary canal it is outside the body, and if it cannot be acted upon by the digestive juices in such a way as to be rendered absorbable, it is as a food-stuff useless. The result of digestion is to convert insoluble substances into soluble ones. The chemical changes which concern us chiefly in the case of bread are the conversion of starch into sugar and albumen into albumoses or peptones. The conversion of starch into sugar takes place (*a*) in the mouth and partly in the stomach, and (*b*) under the influence of diastatic ferment of the pancreas in the small intestine. It is obvious that the digestibility of any bread, so far as concerns the conversion of starch into sugar, will be measured by the rapidity of this conversion. To measure this in the case of salivary digestion we proceeded in the following manner:—

Saliva was collected from three observers, after their mouths had been cleansed with water and the teeth brushed, to remove any particles of food that might be present. The saliva was next filtered, and then was diluted to twice its volume with distilled water. Two grammes of each bread were then weighed out and placed in a small beaker; on to this 30 c.c. of distilled water was poured, and 30 c.c. of the diluted mixed saliva. The result was two digestive mixtures as follows:—

I. White bread	2 grms.
Distilled water	30 c.c.
50 per cent. mixed saliva	30 c.c.
II. Brown bread	2 grms.
Distilled water	30 c.c.
50 per cent. mixed saliva	30 c.c.

These mixtures were placed in an incubator and kept at from 35°–40° C. for half an hour; they were then taken out, and further digestion was stopped by bringing them briskly to a boil. The sugar in each mixture was then estimated.¹ The amount of sugar originally present in 2 grammes of each of the breads in question was then subtracted. The remainder gave for each bread the amount of sugar formed from 2 grammes of it in half an hour by the action of the saliva. These results, however, are not strictly comparable *inter se*, since the original amount of starch was not the same in each, the water-free brown bread containing 65.49 per cent. of starch, the water-free white bread 63.13 per cent. We can, however, calculate the total amount of sugar which could possibly be formed from these two amounts of starch, and then can express the amounts actually formed by the saliva in the case of each bread, as a percentage of the total amount which could be formed. The results will then be comparable *inter se*, and will be a measure of the relative digestibilities, in this respect, of the two breads under consideration. Before, however, referring to the table (Table III.) in which these results are shown, we will consider the action of the diastatic ferment of the pancreas.

The pancreatic diastatic digestions were made upon the same plan as the salivary ones. Benger's liquor pancreaticus was used. Each digestive mixture was made up as follows:—

I. White bread	2 grms.
Benger's liquor pancreaticus	15 c.c.
Distilled water	45 c.c.

A few drops of a saturated solution of sodium carbonate.

- II. The same as I, except that 2 grammes of brown bread were used instead of white.

These mixtures were left in the incubator at a temperature of 37° C. for seven hours. Further digestion was then stopped by bringing them briskly to a boil. While in the incubator the mixtures were from time to time stirred, and their reaction was seen to be alkaline. The sugar was then in each case estimated as before. The results of the diastatic digestions are shown in the following table:—

¹ The estimations were made by Allilher's gravimetric method.

TARLE III.

	Fine Bread.	Whole-Meal Bread.
Percentage of total possible sugar calculated to starch	70.14	72.76
Actual formed sugar :—		
(a) Saliva, half hour	21.64	9.99
(b) Pancreas, seven hours	36.07	19.75
Percentage of actual formed sugar to possible sugar :—		
(a) Saliva, half hour	30.85	13.73
(b) Pancreas, seven hours	51.42	27.14

From these tables it will be seen that in white bread the starch is much more rapidly converted into sugar than in whole-meal bread, both by the saliva and the pancreas.

Having completed the question of diastatic digestion, we next considered the digestion of the nitrogenous constituents. The nitrogenous constituents of bread consist chiefly of vegetable albumen or gluten; this in the process of baking becomes associated very intimately with the carbohydrate constituents of the bread.

The method which we employed to ascertain the relative digestibilities of the nitrogenous constituents of the two breads consisted in submitting equal weights of them at the body temperature for equal times, to (a) gastric digestion followed by pancreatic digestion, (b) to pancreatic digestion alone.¹ It was not thought necessary to make experiments with gastric digestion alone, inasmuch as bread is never digested by gastric juice alone, either in health or disease. For, in cases where the stomach has undergone contraction of the pyloric orifice, such as to prevent the food from passing onward into the intestine, the condition of the patient is so grave that breads are not usually employed for his nutrition.

(a.) *Gastro-Pancreatic Digestion.*—The digestive mixtures were composed as follows :—

- I. White bread 2 grms.
- Benger's liquor pepticus 10 cc.
- Distilled water 50 cc.

II. The same as I., except that 2 grammes of brown bread were taken

¹ The method used really consisted in a modification of Stutzer's method. Zeit. für Phys. Chemie, ix. 211, xi. 207 and 536.

These mixtures were placed in the incubator at 37° C., and allowed to remain there ten hours. They were from time to time stirred, and their reaction seen to be acid. At the expiration of this time they were brought briskly to the boil and filtered. As the filtering was somewhat special, it will be better briefly to describe it. The filtering medium consisted of purified asbestos and perforated platinum cones. The filtrate was thrown away; the residue together with the asbestos was carefully removed from the platinum cone and placed in a small beaker. The residue was then submitted to pancreatic digestion, as described above, for six hours, and again filtered in the same manner. The final manipulations consisted in estimating the nitrogen in the final residue, and multiplying it by 6.25 to convert it into albumen. This gave the amount of albumen which remained undissolved after gastric and pancreatic digestion, since the albumen which was rendered soluble by digestion passed through the filter and was thrown away. The nitrogen estimations were made by Gunning's modification of Kjeldahl's method.¹ Having thus obtained the amount of undigested albumen, this was subtracted from the total amount of albumen originally contained in the breads, and the remainder gave the amount of albumen dissolved, *i.e.* digested and thrown away in the filtrates. But since the breads originally contained some soluble albumen (see Table II.), in order to know accurately how much albumen had been digested, the quantity of albumen originally soluble in each bread must be subtracted from the total quantity of soluble albumen obtained after digestion. This was done, and the remainder gave the quantity of albumen actually digested. Before directing attention to the table in which these results are contained, we will briefly describe the experiments made upon the relative digestibility of the two breads in question by the pancreatic juice alone.

(b.) *Pancreatic Digestion.*—Two digestive mixtures were made exactly similar to those used in the case of the pancreatic diastatic digestions. These were left in the incubator for eleven hours at a temperature of 37° C., and then were filtered exactly as in the case of the gastro-pancreatic digestions described above. The nitrogen, however, in the residues was then estimated, and the numerical calculations were made as in the other nitrogen estimations.

As each bread contained originally a different quantity of nitrogenous matter (albumen), to make the results of the gastro-pancreatic and pancreatic digestions comparable *inter se*, we have expressed the amount of digestive albumen as a per-

¹ Zeit. für Anal. Chemie, 1889, 189.

centage of the total albumen originally contained in each bread.

TABLE IV.

	White.	Brown.
	Per Cent.	Per Cent.
Percentage of nitrogenous matter digested, calculated to total nitrogenous matter in water-free breads :—		
(a) Gastro-pancreatic digestion :—		
Ten hours gastric }	74.89	60.71
Six hours pancreatic }		
(b) Pancreatic alone, eleven hours	79.38	69.61

From this table it will be seen that in the case of the gastro-pancreatic digestion of white bread, 14 per cent. more of the nitrogenous constituents were digested than in the case of brown. In pancreatic digestion the excess of nitrogenous matter digested in white bread amounts to nearly 10 per cent.

The next subject which we shall consider is the difference in the amounts of cellulose contained in white and brown bread. Upon reference to Table II. we shall find that the water-free white bread with which we worked contained 39 per cent. of cellulose, whereas the water-free brown bread contained 1.68 per cent. This difference is considerable. It does not, however, express the whole difference. Not only was the quantity different, but the quality. The cellulose in the breads was determined by the Wiender method, viz., by successive boiling with sulphuric acid, water, and caustic potash. After equal weights of bread had been treated in this manner in glass beakers, the residues were, even to the naked eye, very different both in quantity and quality. The cellulose in the beaker with brown bread was in thick, deeply pigmented flakes, and relatively large in amount, whereas the cellulose in the beaker with white bread was less in amount, and in very small, thin white flakes.

Cellulose is one of the most insoluble and indigestible substances known. Some cellulose appears to be absolutely indigestible; some, on the other hand, seems partially digestible. Some experiments were made upon this subject by H. Weiske.¹ This observer worked with the cellulose obtained from celery, carrot, and cabbage, and he found that from 62.7

¹ Zeit. für Biologie, 1870, p. 456.

to 47.3 per cent. of it was digested. The digestibility of cellulose contained in bread is probably very much less than this. In other words, in the human subject the nutritive value of cellulose can practically be neglected. Cellulose, however, has another property which we must consider. It exerts mechanically an irritant action upon the intestines. This action is in inverse proportion to the fineness of its division; in other words, the larger the flakes of cellulose, the greater the irritant action. The irritant action consists in stimulating intestinal peristalsis; as a result of this, sluggish intestines may be stimulated by brown bread up to the normal condition, whilst in irritable intestines it may not get exposed for a sufficiently long time to the action of the digestive juices; hence digestion may only partially take place, and both a loss of nutritive material and diarrhoea may ensue.

The last difference in these two kinds of bread of which we have to speak is the excess in the amount of fat and salts (phosphates) which is contained in brown bread. In this case chemical difference probably expresses pretty accurately nutritive difference. If we refer again to Table II., we shall find that while water-free white bread contains only 0.34 per cent. of fat and 0.26 of phosphoric acid, brown bread contains 1.05 per cent. of fat and 0.85 per cent. of phosphoric acid. Probably, in fact almost certainly, all the salts and all the fat in bread are absorbed, and therefore, in this respect at any rate, if we neglect the fact that brown bread may remain for less time in the alimentary canal, brown bread is superior to white. A further difference between white and brown bread consists in the fact that minerals are present to a much larger amount in the latter. Practically, in many dietaries the chief source of calcium is the bread, and if this be deficient, not only may the bones be imperfectly nourished, but the muscles, heart, and other tissues also, and have their functional activity consequently impaired.

From the above experiments we are then justified in concluding that the higher nutritive value which we might, upon pure chemical grounds, ascribe to brown bread, cannot, with the single exception of fats and mineral constituents, be maintained from the physiological side. On the other hand, distinctly less of the nutritive materials actually get into the blood in the case of brown than of white bread. The only other experiments upon the subject which we have been able to find, although obtained in an entirely different way, confirm our own results. Meyer¹ gave to dogs and men approximately

¹ Zeit. für Biologie, 1871.

the same quantities of different kinds of bread, with also the same quantities of beer and meat, over considerable lengths of time, estimating, meanwhile, the amount of fæces. In the case of both the fæces and bread, he made three sets of estimations, viz., total dry substance, nitrogenous constituents, and ash. The percentage of these constituents absorbed, in the cases of white bread and pumpernickel—the brown bread of which we spoke some time back—are as follows :—

Bread.	Total Dry Substance.	Nitrogenous Substance.	Ash.
	Per Cent.	Per Cent.	Per Cent.
White bread }	94.4	80.1	69.8
	80.7	51.7	3.4

In experiments such as Meyer's, a large margin must be allowed for error. But the differences between the two rows of figures in the above table justify us in concluding that his experiments made on the living animal confirm ours, made with artificial digestive mixtures, and warrant us in regarding the results as accurate.

In our opinion, the above results allow us to formulate the following conclusions :—

I. White bread is, weight for weight, more nutritious than brown. Therefore it appears the preference given by operators in large towns for white bread has, to a certain extent, a sound physiological basis.

II. In the case of people with irritable intestines, white bread is to be preferred to brown.

III. In the case of people with sluggish intestines, brown bread is preferable to white, as it tends to maintain regular peristaltic action, and ensure regular evacuation of the bowels, with all its attendant advantages.

IV. In cases where the proportion of mineral ingredients, and especially of lime salts, in other articles of food or drink is insufficient, brown bread is preferable to white. It is possible that in the case of operators living chiefly upon bread and tea, the preference for white bread which obtains in large towns may be responsible in part at least for the early decay of the teeth of those living on such a dietary.

V. An abundant supply of mineral constituents is especially required in pregnant and suckling women and in growing chil-

dren, in order to supply material for the nutrition of the fetus, the constituents of the milk, and for the growth of the tissues, especially of the bones. In such cases, if mineral salts, especially those of calcium, are supplied by other food-stuffs, drinks, or medicines, brown bread is preferable to white.

VI. If the dietary is insufficient in fat, or if the patient is unable readily to digest fat in other forms, brown bread may possibly be preferable to white.

REPORT OF THE YEAR'S WORK IN THE ELECTRICAL DEPARTMENT.

BY

H. LEWIS JONES, M.D.

This paper is intended to show the nature of the work done in the Electrical Department, and takes the form of an analysis of the cases which have been referred thither during the twelve months ending with September 1897. The total number is 612, falling into four main groups, as follows:—

Affections of the nervous system	226
Other morbid conditions	77
Nævus cases for electrolysis	92
Cases for X-ray examination	217
	<hr/>
	612

Were it not for the X-ray cases, the numbers would show a decrease from those of recent years. The supply of cases to the Electrical Department depends a good deal upon the Casualty officers, and tends to vary, both as to numbers and as to the character of the cases sent, with changes in the *personnel* of that department. Moreover, the very considerable amount of extra work absorbed by the X-ray cases has had the effect of consuming time which might otherwise have been spent in seeking new cases in the different departments of the Hospital. At one time the X-ray work threatened to swamp us, and to turn the electrical into a photographic department; but now that branch of the work is simplified, and a large number of the X-ray cases are disposed of at once, without any recourse to photography, by the use of the fluorescent screen.

A small dark chamber has been put up in the department for these examinations, and the apparatus is kept ready for immediate use, so that a patient can be brought over at once from the Surgery and instantly examined by the House-Surgeon himself, a method which is more satisfactory in many ways

than the slower process of having a photograph taken. A developing room has also been fitted up in one of the cellars under the workshop, and the photographs can be developed in comfort. This part of the work is now done, and done very nicely, by the attendant in the department. The cost for the year of the X-ray work to the Hospital amounts to about five shillings for each case for materials and maintenance. It is certain as time goes on that larger and more powerful instruments will be needed for the X-ray work, the tendency at the present time being decidedly in the direction of longer spark lengths and higher vacua in the Crookes' tubes. Already coils giving 12.15 or 18 inches of spark are being used in some quarters where 6-inch sparks were thought ample a year or so ago. Tubes with very high vacuum give better penetration for thick parts of the body, but they need enormous electromotive forces to excite them. I expect that soon the induction coil will be superseded by the Wimshurst machine for providing the enormous electric potentials required. Already the cost and the difficulty of making the large induction coils are becoming serious; and the Wimshurst machine gives splendid results, and, while costing less than a big coil, has the great advantage of requiring no batteries or accumulators to work it.

The following is a list of the most important groups of cases which have come under treatment during the year:—

Diseases of the brain	14
Infantile paralysis	39
Other spinal cord affections	17
General neuritis	8
Peripheral palsies—	
Facial	17
Cervical nerves and brachial plexus	14
Circumflex	16
Musculo-spiral	33
Median	6
Ulnar	12
Peroneal	2
Myopathic atrophies	4
Spasms and tremors	11
Sciatica	13
Rheumatoid arthritis and rheumatism	13
Incontinence of urine	6
Graves' disease	5
Functional aphonia	5
Tinnitus aurium and deafness	16
Diabetes	2

Diseases of the Brain, 14.—Hemiplegia, 4; epilepsy, 4; chorea, 3; optic atrophy (tabetic), 2; head injury, 1.

The results in this group are not very favourable. In hemiplegia it is not reasonable to expect recovery when there is marked evidence of secondary descending degeneration. In patients suffering from the effects of a mild paralytic stroke, electricity accelerates the return of voluntary power in the weakened muscles, and at times its good effect is very marked, while some advantage may be expected in all but the worst cases. Electrical applications are therefore valuable during the period of recovery from a hemiplegia. Except in one case, I have not attempted direct galvanisation of the focus of mischief in head, but treatment has been confined to a general stimulation of the affected limbs. The case in which it was attempted to influence the motor cortex directly was one of a little girl aged 10, with post-hemiplegia, spasm, and tremors. In her case one electrode was applied to the well-moistened scalp, and the hand and wrist were held in a bowl of water containing the other; a constant current of about five milliamperes was used. There has certainly been an improvement during the attendance, but so slowly that it is difficult to know whether it is due to the electricity or to lapse of time. She has attended for three years, and though several times discharged, is brought back again after a time by her mother, who feels certain that the child loses ground if treatment is stopped.

In the cases of epilepsy and of tabetic optic atrophy no benefit has been noticed. In chorea electricity is useful when the choreic movements are tending to become habitual, so that it offers a means of treating those cases, not uncommonly met with, which are inclined to drag slowly on for a long time. Cases of recent or severe chorea are not referred to the department, so that I am unable to speak from experience of the effects noticed by Golding Bird at Guy's Hospital in the earlier part of this century. The case of head injury was one with secondary descending degeneration of the cord, and the results of treatment were nil.

Myelitis, 17.—Of these, four were cases of polio-myelitis, two were acute, one in a male aged 55, the other in a male aged 17. In both the upper limb was extensively affected, and both recovered well. A third case of atrophy of the gluteal muscles probably belonged to the same category, while the fourth was chronic and progressive. Six cases were chronic myelitis (spastic), three after injury, and three of gradual onset without cause assigned. Of the others, one followed influenza,

one was due to angular curvature of spine, one was a slight case of simple transverse myelitis. A case of ataxic paraplegia, one of diver's paralysis (symptoms referred mainly to deltoid region), and two of double pes cavus, both probably of spinal origin, complete the number.

Infantile Paralysis, 39.—Among the cases of infantile poliomyelitis there was not much of special interest; the lower extremities were affected in 38 cases, the upper in one only.

The results of treatment in this disease are certainly good if the electrical applications are persevered with. Of those sent to the department, a certain proportion continue attending for long periods, and these all gain considerably in power.

The prospects of recovery in these cases can be summed up briefly as follows:—Muscles retaining their normal reactions, however feebly, can be largely restored; those with the reaction of degeneration, well marked and persisting long, can also be improved to a certain extent; those showing total loss of reaction within six months of the attack are the least favourable, and in these very little improvement can be hoped for. During the year I have had an opportunity of examining the amputated leg of a case of this kind. In testing the dissected and exposed muscles, one finds a very close correspondence with the results obtained during life. In addition, a faint contractility may be found in some muscles in which it is not perceptible without dissection. It is noteworthy that a visible reaction of degeneration may persist in a paralysed muscle for ten years and more. Indeed, paradoxical as it may seem, I feel sure that the survival of reaction of degeneration for a long period in a muscle must mean that it still preserves some living connection with its motor nucleus; for when the total severance of the nervous connection is certain, as in cases of complete division or destruction of a nerve trunk, then reaction of degeneration is a transient symptom, succeeded within a few months by total loss of all electrical reactions.

In both the dissections of infantile paralysis which I have had the opportunity of making, I have been much interested to find that total destruction of a muscle is rather the exception than the rule, even in these most severe cases of infantile paralysis. Generally there is a contractile remnant, and it is from this remnant that the muscle has to be rebuilt. If it can by any means be artificially stimulated, and grown on until it becomes useful to its owner, then its further growth is assured through the voluntary employment of it; and it is by means of prolonged electrical treatment, massage, and exercise that its

growth has to be started and kept up in the early stages before it is strong enough for ordinary use.

To leave a case of infantile paralysis untreated because normal reactions can be obtained in the wasted muscles is never so judicious as to treat it. If left to itself, such a muscle is likely to remain weak and wasted for years, but it will commence to grow at once if active treatment is begun. I am certainly very satisfied with the progress which these little patients make in our department. In repairing the damages done by infantile paralysis, we are able to help some cases much, and some only a little; but taking them as a class, and mindful of the limitations imposed by the nature of the spinal lesion, I regard them as showing excellent results from electrical treatment.

General Neuritis, 8.—Alcohol, 3; arsenic, 1; diphtheria, 3; influenza, 1.

These are cases of neuritis with a general distribution of the symptoms. Many cases of neuritis, due to some cause affecting the system at large, will also be found entered under the varieties of peripheral palsies. Double wrist-drop from lead, for example, might be dealt with under the head of general neuritis, though it is more convenient in some respects to place it with other conditions causing wrist-drop; so, too, the diverse nervous symptoms referred to under several headings as due to influenza.

The cases of alcoholic neuritis have made excellent recoveries under treatment. In a severe case which was referred to the department some time ago by Dr. Hensley, the muscles not only recovered their power and the normal reactions which had been completely lost, but even grew abnormally large.

The case of arsenical neuritis is an interesting one of a not very common condition. The patient was a gaoler in a prison in Ceylon, and in May 1896 an attempt was made to poison him with arsenic; fortunately he survived the dose, though the vomiting and purging were severe. Six days later he felt numbness in the left heel; this spread to both feet and both hands, and was followed by great weakness in all his limbs, so that he could not walk, nor feed himself, nor button his clothes, nor sign his name. Subsequently he began to recover and was sent home, and on October 1, 1896, he arrived at St. Bartholomew's Hospital with a letter from his medical man addressed to me in the Electrical Department. Then he had loss of knee-jerk, pain and weakness in his limbs, and his gait was weak, but not otherwise peculiar. There had been no affection of the sphincters at any time; there was marked diminution of re-

actions to the induction coil, and to cells some sluggishness of reaction (partial reaction of degeneration). No conspicuous muscular wasting. Under treatment he has gone on steadily towards recovery, and has returned to his duties apparently well, though he still finds himself not so strong as he was. The toe-nails have been shed twice during his convalescence. The knee-jerks are still very poor. The treatment was by general electrification in the electric bath.

The three diphtheritic cases are not of special importance; all made good recoveries, as they often do, the toxic effect of the diphtherial poison being transitory. Those referred to us receive general electrification in the electric bath with the alternating current from the lighting mains at a reduced voltage, and appear to derive benefit from it. The electric bath is used as the medium in treating all the cases of general neuritis.

Peripheral Palsies.—The numbers arranged under these headings show that the treatment of peripheral neuritis forms an important part of the work of the department. The diagnosis of them also supplies an exercise in applied anatomy which would be of service to students. There are many points of interest about these cases, which will be referred to under the separate heads. The results of treatment are very good, and most of them leave the department greatly relieved or completely well.

A large proportion of the numbers are cases of injury to the nerve trunks, and lead poisoning comes next in order of frequency as a cause. Diphtheria, influenza, and alcohol are also responsible for a few cases, while indirectly, as a predisposing cause, the effect of alcohol is conspicuous. Syphilis also appears as the exciting cause in certain instances.

That alcohol not only causes a special form of neuritis, but also plays an important part in predisposing to neuritis from injury, is to me clear. The examples of wrist-drop from pressure during sleep occur, with very rare exceptions, in persons actually the worse for drink at the time of the accident, and many of them are persons obviously addicted to drink. Some little time ago we had under treatment a potman who had twice developed pressure paralysis—once from using a crutch for a few days, and once from sleeping upon his arm.

Affections of the deltoid, with pain and wasting, are frequently seen in people who show signs of intemperance, and in people of this kind progress towards recovery may be greatly delayed. "Sciatica" is sometimes brought on or kept up by alcohol, and I have specially in mind a patient (not a Hospital

case) who was said, among other things, to consume a pint bottle of champagne daily in the forenoon, and had a long and very troublesome attack of "sciatica" from a neuritis sufficiently intense to produce the reaction of degeneration in the intrinsic muscles of the foot.

Syphilitic Neuritis.—Two cases of peripheral paralysis, which were probably due to syphilis, have been under treatment during the year. In one there was facial paralysis affecting successively the two sides of the face, with numbness and tenderness in various parts of the body; and the other was a facial paralysis which occurred in a patient with a late syphilide of the scalp, and disappeared quickly under iodide of potassium. A more striking instance of syphilis attacking the peripheral nerves is the following, which came under my notice in 1893. A man, aged 41, was sent to the department with pains and wasting in the muscle of the right arm. Examination revealed a patch of tertiary syphilide upon his chest, and he was therefore treated medicinally as well as by electricity. In five weeks he had recovered and returned to work. Six months afterwards he came back, with pains and muscular wasting in the left leg and thigh, and with a tender sciatic nerve, and again he recovered in four weeks under treatment, as before. Two months later he developed periostitis in the right femur, and after recovering from that he disappeared for eighteen months, but at the end of that time returned in a miserable plight and with facial paralysis. He had been in a country infirmary with a sciatica for part of the interval; after this he disappeared from sight.

Facial Paralysis, 17.—Most of these gave the usual history. In one case, a young woman, herpes of the ear and side of the neck appeared a week after the paralysis. She came to the Hospital nine weeks after the onset, and the paralysis was then complete, with complete reaction of degeneration. In another month recovery had begun, and went on slowly and steadily, until, in four months from her first appearance, the recovery was almost completed, and she returned to her home in the country. Normal reactions had returned, and it was hardly possible to see which had been the paralysed side.

In many cases I have known facial paralysis remain quite stationary when treated "expectantly," and start towards recovery directly electrical applications are commenced. Cases of facial paralysis of several weeks' duration are often sent up for treatment from a distance, because they are making no progress while left to themselves, and they usually respond at once to treatment.

The prognosis in facial paralysis of the ordinary sort is remarkably good, except in old and worn-out people.

Cervical Nerves and Brachial Plexus, 14.—After violent injury or dislocation at the shoulder, 5; Erb's paralysis, 7; disease, probably syphilis, 3. All cases of interest. Of the Erb's paralysis type, four were in infants from injury at birth, two in adults from severe falls upon the shoulder, one from a neuritis, the cause of which was unexplained.

The cervical nerves are coupled with the brachial plexus because they sometimes suffer together. Thus one of our cases had paralysis, with great wasting in the right trapezius and sternomastoid (cervical nerves), and in the serratus magnus and deltoid. His attack came on in April 1897 with much pain, and the wasting slowly followed; in September he was referred to the department; and in October a similar condition developed on the left side, in the trapezius, deltoid, and triceps, but under steady doses of iodide of potassium the symptoms abated without causing serious damage to the muscles; on the right side, which was first attacked, the serratus magnus and the trapezius and sternomastoid remain in a state of extreme atrophy. Another interesting case of injury to cervical nerves and brachial plexus is one which I saw in Sir Thomas Smith's wards, of a boy who was caught by the neck under a descending lift, and developed a double Erb's paralysis, with marked affection of both phrenics.

Circumflex Nerve, 16.—Direct injury, 1; "deltoid rheumatism," with or without muscular wasting, 9; occupation cramps or paralysis, 5; after influenza, 1. The circumflex nerve or deltoid were also concerned in most of the cases dealt with under the last paragraph; the case of occupation cramp was in a blacksmith.

Musculo-Spiral, 33.—Lead, 10; pressure during sleep, 9; from crutches, 4; injury, 8; after influenza, 1; unclassified, 1.

Among the cases of double wrist-drop there have been three in whom no evidence of lead could be found. One of them worked with gold-leaf and one with brass, while in one nothing could be found as a possible cause except that he handled much silver and copper coin during his duties as a money-taker. In one of the cases due to lead the deltoids were also markedly affected.

There is nothing of special interest in the cases of pressure paralysis.

The case supposed to be due to influenza was double, and had a distribution like that of lead. One patient, a man aged 47, who could not account for his condition in any way, had a

paralysis limited to the extensors of the thumb and index, with marked reaction of degeneration. He recovered under treatment. One of the cases (unclassified) is a case of muscular atrophy, coming on slowly with pains, and affecting the coracobrachialis, the triceps, and all the extensors below, except the supinator longus, which seemed a little hypertrophied; the electrical reactions are extreme simple diminution, the remaining muscles being natural. The patient is a girl of 18. Only the left side is affected.

Median Nerve, 6.—Injury, 4; with operation for uniting a divided nerve, 1; pressure during sleep, 1; occupation palsy, 1.

No special interest in these except that an affection of the median nerve from pressure during sleep is uncommon. Results of treatment good.

Ulnar Nerve, 12.—Injury, 9; occupation, 1; unclassified, 2.

Three were injuries of musculo-spiral as well, namely, one caused by the wheel of an omnibus, one from a blow on arm from a heavy falling body, and one after an operation for excision of elbow; two were injuries to median as well as ulnar, while in two there were operations for union. The unclassified cases are both of middle-aged men, with wasting of intrinsic of one year's standing. There was something similar, but less marked, in the other hand in one of them—the other hand a one-sided wasting; and there was also evidence that the extensors of the wrist and fingers were involved. The case due to overwork occurred in a farrier, with wasting of intrinsic on the right side, numbness, pains up the arm, and so forth. There is no note of the results of treatment in his case.

Lower Limb, 2.—Injuries to the nerves of the lower extremity are decidedly rare, and on the average two or three are all that we see each year. One of these presents an interesting type. A woman engaged in sewing leather sat with the left leg crossed over the right knee, and in that way held her work tightly between the knee and the under side of a table. The right patella must have compressed the left peroneal nerve, for she had loss of power in the muscles of the front of the left leg. The other was similar as regards region affected, but no history of pressure could be made out. In a previous year there was a very similar case to the one just described. A carpenter sat in an awkward position, with one leg doubled up under him, to do a difficult piece of work, and compressed one external popliteal nerve, with the result of producing foot-drop. Most of the cases of injury to nerve in lower extremity are injuries to the exterior popliteal nerve at the point where it winds round the fibula to reach the front of the leg; in other parts of the limb

the nerve trunks are singularly well protected from accidental injury.

Myopathic Atrophy, 4.—Cases of muscular wasting, with, as a rule, simple decrease of the electrical reactions affecting the upper extremities, and symmetrical, or nearly so.

Besides these, there has been under care a very well-marked instance of the type named after MM. Landouzy and Dejerine in a woman. In her case the affection of the trapezii causes great forward inclination of the head, and great difficulty in holding it erect. The face muscles, latissimus dorsi, serratus magnus, supinator longi, are all affected on both sides in unequal degrees. Under treatment for two years, there has perhaps been some gain of power, and at least there has been no unfavourable advance in her symptoms.

Spasm, Tremors, and Writer's Cramp, 11.—Spasm and tremors are very difficult to relieve. In writer's cramp the treatment seems valuable, provided the occupation causing it can be suspended, and the same can be said of other occupation neuroses, of which there were five—three referred to the circumflex nerve and one each to the ulnar and the median nerves.

Aphonia, 5.—Functional aphonia, though often dispelled at once by electric shocks, is sometimes refractory. If a good result is not obtained at the first few applications, there is not much advantage to be obtained from going on with them.

Rheumatism and Rheumatoid Arthritis, 13 cases.—Great relief in two cases, remainder no good result.

These results are very poor, and, I think, below the average of former years. In rheumatoid arthritis treatment should be begun at an early stage of the disease, for when crippling of the joints has become marked it is too late to do much good.

There are several patients, new cases of former years, who return from time to time to ask for further treatment, the progress of their symptoms having been arrested for a time by what had been done for them. In all cases the treatment has been by the electric bath, with the sinusoidal current from the mains of the Supply Company, suitably regulated and lowered to suit the requirements of the cases.

Sciatica, 13.—10 males, 3 females.

Three came only once, and there are therefore no notes of the result. Of the remainder seven were cured, and three much relieved—the duration of treatment being on an average four weeks. Treatment was by the electric bath, with sinusoidal current from the electric light mains in most of these. Sciatica is a disease which responds quite satisfactorily to treatment by electricity, and I think our results would be even better than

they are if treatment were not often postponed until after the attack has lasted a long time. Stale cases of sciatica are far more difficult to influence than recent cases. Where an attack is recent and the pain is severe, I have found the labile application of the battery current most useful, large currents of thirty to fifty milliamperes and large electrodes should be used; a descending direction of the current seems to be slightly the best. Interruptions and shocks must be avoided. In these acute cases the interrupted current of an induction coil and the sinusoidal current of the mains both seem to aggravate the pain. In old standing cases and those where the pain is not very severe, the interrupted or alternating current in the electric bath answers best.

Exophthalmic Goitre, 5.—Some sent for treatment, others for measurements of resistance. I have never yet seen a case of this complaint permanently benefited by electricity; often the subjects may feel slight improvement for a time, but that is all, in my experience.

The low electrical resistance of the subjects of Graves' disease is merely an expression of the moisture of the skin so often noticed in them. In one sent to us the skin was dry and the electrical resistance was not low; in others, the resistance approximates more to the average when the persons with whom they may be compared have the skin carefully soaked and moistened before the measurements are made.

Incontinence of Urine, 6.—A lower number of cases than the average in previous years. Two were the subjects of bladder disease, and were referred to the surgical side, three were true nocturnal enuresis, and one diurnal, the result of instrumental dilatation of the sphincter.

Both of these classes of cases, viz., nocturnal or reflex incontinence and incontinence from weak sphincter, are curable by electricity; all four did well.

Tinnitus Aurium, 16. A certain percentage of these cases were much relieved, say one-third. The remainder were unrelieved or doubtful.

Diabetes, 2.—No good results. Occasionally the output of sugar seems to be favourably influenced by electrical applications.

Nævus, 92.—It has been a heavy year with nævi, and there have been several very large and very troublesome cases. One involved the whole area and thickness of the right cheek, another the whole of the nose, right through from outside to inside. Although these large nævi are very tedious through needing a large number of operations, yet in the end the results

are satisfactory, so that for nævi which do not admit of excision electrolysis is the best mode of treatment; but where excision can be done, it is to be preferred before electrolysis, on account of its being quicker and more thorough.

In addition to the cases seen in the department, a good deal of work is done in attending with cauteries, cystoscopes, and electric lamps when required in the wards or operating theatres. The maintenance of the batteries used in the wards, and especially of the accumulators, entails a considerable amount of attention. Induction coils for use in emergencies are kept permanently ready for use in the Surgery and the operating theatres.

CYSTIC DISEASE OF THE KIDNEYS AND LIVER.

BY

J. FORBES, M. B.

BEFORE entering upon a detailed account of cystic degeneration of the kidneys and liver, I will briefly classify the various forms of cystic change met with in these organs.

I. The kidneys.

(a.) Cystic disease—

1. The congenital form;
2. The acquired form, affecting one or both kidneys.

(b.) Cysts occurring in the course of chronic interstitial nephritis (the granular kidney), as—

1. Small multiple cysts.
2. Large single cysts.

(c.) Large serous cysts.

(d.) Cystic neoplasms.

Cystic adenoma.

Cystic carcinoma.

II. The liver.

(a.) Cystic disease (unassociated with similar change in the kidneys)—

1. Congenital.
2. Acquired.

(b.) Cysts occurring in the course of cirrhosis.

Cysts due to biliary obstruction.

(c.) Cystic neoplasms.

III. Cystic disease of the kidney and liver—

1. Congenital.
2. Acquired.

I intend paying particular attention to the cystic disease of the two organs, and shall only mention other cystic conditions for purposes of comparison.

Cystic disease was long ago observed by early writers, but confounded with the isolated cysts occurring in the granular kidney. Among these writers should be mentioned Willis, Bonnett, and Van Doeveren.

Plater attributed certain forms of ascites to the rupture of the cysts, as also did Morgagni.

Hufeland seems to have been the first to describe multiple cysts under the name of cystic degeneration. Rollet mentions a case of a woman who fell dead in the street; on post-mortem examination both kidneys were the seat of advanced cystic change. Further cases were described by Littré, Howship, and others.

Up to this point no clear distinction between isolated cysts and cystic degeneration had been attempted.

Rayer first attempted to differentiate the two conditions; he divided renal cysts into three varieties:—(1) simple cysts, (2) encephalocyte cysts, and (3) urinary cysts; and describes cystic degeneration of both kidneys as a rare anomaly.

Cruveilhier, in his turn, describes the same lesion under the title of cystic transformation of the kidney.

For a long time the cystic kidney remained a post-mortem discovery, but its pathology was the subject of much study and discussion. Haller and Morgagni thought that dropsy of epithelial cells gave rise to the cysts by gradual distension.

At this time (1864) Virchow took the most prominent part in discussing the pathology of the disease. He attributed the congenital cystic kidney to an intrauterine nephritis causing atresia of the papillæ, and further considered the adult form to be due to a persistence of the foetal degeneration. Contributions to Virchow's Archives, 1864-65, followed from various writers, notably Erichsen, Hertz, and Klein, all of whom concluded that interstitial nephritis was the original lesion.

At the same time, others held the view that the lesion was the result of a faulty development of the renal tissue.

The earliest record I have been able to discover of cystic disease of the liver associated with that of the kidneys is a case reported by Bristowe in the Pathological Society's Transactions in 1856, where he attributed the cystic change in the liver to an alteration in the hepatic cells, and rejected the idea of its originating in the bile ducts.

Bristowe also considered that, when present, cystic disease of the liver was always associated with that of the kidney, on account of the physiological relation between the two. This coincidence was also remarked by Frerichs and by Lanceraux in 1864.

Hitherto cystic degeneration of the kidney, believed by most authors to be an interstitial nephritis, was as yet quite disregarded from the clinical point of view.

In 1876 Laveran was the first writer to state that cystic degeneration of the kidneys in the adult ought to be distinguished from that condition in the new born, from hydatid cysts of the kidney, from secondary cysts developing as the immediate result of interstitial nephritis, and from hydronephrosis. He attempted an outline of the diagnosis, but owned that it still seemed almost impossible.

In the same year Michalowicz made a study of cystic degeneration, and concluded that this condition of the kidney was not so rare as was thought; that it affected both kidneys, and often occurred in other organs, such as the liver and thyroid gland. He considered it analogous with cystic disease of the testicle, breast, and ovary.

Malassez was among the first to depart from the theory that cystic degeneration was the result of interstitial nephritis. For he considered that the cysts originated in an epithelial proliferation of the tubules; and this view was supported by Lanceraux.

In discussing the same condition in the liver, the former states that the cysts originate in bile ducts of new formation. He was supported in this theory by Courbis, who published a paper on cystic disease of the kidneys and liver in 1877.

Both these authors differed from earlier writers, notably Virchow and Frerichs, who attributed cysts in the liver to retention of bile in the original ducts. To this condition of epithelial proliferation Rindfleisch and Naunyn gave the name adenoma, and Malassez called it mucoid epithelioma, considering that the cysts were a neoplasm.

Labourin, in articles published in 1882 and 1884, upheld their view.

In 1883 Dr. Pye Smith reported a case of cystic disease of the kidneys and liver, and in the latter attributed the cystic change to a vacuolation of the hepatic cells. This theory was later supported by Bristowe and Hale White.

Frerichs has proposed a somewhat similar hypothesis to account for cystic change in the kidney, attributing it to an accumulation of fluid in the cells of the tubules, and met with support from Bristowe and Wilks.

In 1886 Brodeur drew attention to the danger of surgical interference in cases of bilateral cystic disease.

In 1887 an entirely new theory was set on foot by Shattock to account for cystic disease of the kidney in the new born—

namely, that of histological maldevelopment due to a persistence of the Wolffian body.

Virchow originally suggested maldevelopment as being a cause of cystic change, on account of its common association with other developmental malformations.

In the same year Hommey stated his opinion that the cystic kidney was quite independent of renal sclerosis, but closely resembled cystic conditions of the breast and ovary, and was analogous with the formation of new growths.

Lejars in 1888, in an elaborate thesis on the subject, showed himself in favour of the "new-formation theory," to account for the origin of the cysts.

This theory is supported by many foreign authors of the day, notably Nauwerck, Hufschmidt, Von Kahlden, as mentioned in Ziegler's "Beiträge," vols. xii. and xv.

In 1890 Bard and Lemoine published a full article in "Les Archives de Général Médecin" on cystic disease of glandular organs, especially the kidneys and liver. They consider that the cysts are produced by simple dilatation of the acini and ducts, due to the normal pressure of the secretion, and that this dilatation is due to congenital weakness of the walls of the glandular tubes.

Most recent contributions on the subject of cystic disease come from Still, Kanthack, and Rolleston; the former attributes the condition to irregular development, an "overgrowth of the mesoblastic elements of the organs leading to cystic dilatation of the tubes;" while Kanthack and Rolleston considered it due to chronic inflammatory changes, and in the case of the liver allied to biliary cirrhosis.

Morgan, in the recent Lettsomian Lectures, has described certain cases in which traumatism has given rise to the formation of unilateral renal cysts by the liberation of inflammatory products into the perirenal tissues.

ETIOLOGY.

The congenital form of cystic disease of the kidneys may occur alone, or associated with that of the liver during intra-uterine life, and, if in an advanced state, generally results in the death of the foetus by obstructing the natural course of labour, as in five out of eight cases which I have collected. In one of these five, birth was premature, occurring in the seventh month.

Besides possessing this abnormality, the foetus is not unfrequently the subject of other abnormal conditions. One of the

cases above referred to was anencephalic, and another, the only one of the five in which kidneys and liver were affected, had six fingers on each hand, webbed toes, and a meningocele.

This is a point which Virchow considers of importance, in that it indicates the possibility of developmental error being the origin of the cystic change.

Among other anomalies accompanying congenital cystic disease, he mentions horseshoe kidney, cleft palate, and hydrocephalus.

Three out of the eight cases survived birth—one by four weeks, the second by eight weeks, the third by ten months. In all three the urine was loaded with albumin; there was general œdema and ascites, and death resulted from uræmia.

In the first of these three there is a family history of several of the other children having died in the same way. On post-mortem examination both kidneys and liver were affected in each case. The liver in two of these congenital cases was only found to be cystic on microscopical examination, for no cysts were visible to the naked eye.

That form of cystic disease which occurs in the adult alone, or associated with similar disease of the liver, is usually fatal in middle life, between the ages of 40 and 50. But microscopical examination shows that the condition has been in process for a considerable length of time.

Of 38 cases which I have succeeded in collecting, 10 proved fatal between the years 41 to 50; 8 between 51 to 60. This coincidence agrees with the cases recorded by Lejars in 1888, which I have analysed. The statistics of my cases read as follows:—

Age.	Kidneys.	Liver.	Kidneys and Liver.
20-30	5	...	1
31-40	4	2	...
41-50	8	1	1
51-60	5	...	3
61 upwards	2	...	2

Those of Lejars thus:—

20-30	2	{ none recorded }	...
31-40	11		2
41-50	17		7
51-60	5		4
61 upwards	5		3

The youngest case mentioned by Lejars is that of a child who died at the age of $5\frac{1}{2}$; he states that her condition

was almost certainly congenital. Of the others, the youngest recorded by this author was a man aged 23, and the oldest a woman aged 88.

The age limit of cases I have collected ranges from 19 to 68.

As regards sex, where the kidneys alone are affected, the majority of cases occurs among males, but where the liver is also involved, the greater number are found among females.

The statistics collected by Lejars and myself agree on these points. My own read thus:—

	Kidneys.	Liver.	Kidneys and Liver.	Total.
Male . . .	17	3	3 = 23	} 38
Female . . .	7	3	5 = 15	

Lejars' as follows:—

Male . . .	28	{ none	} 5 = 33	} 58
Female . . .	14	{ recorded	} 11 = 25	

Among my female cases four had borne children:—

- (1.) Aged 59, four children. History: four weeks. Date of last child unknown.
- (2.) Aged 32, two children. History: six months. Date of last child unknown.
- (3.) Aged 24. Died during the eighth month of pregnancy after premature delivery. Liver and kidneys affected.
- (4.) Aged —, two children. Liver and kidneys affected.

Among Lejars' cases three had borne children:—

- (1.) Aged 51, five children; seven miscarriages. Last child six years before death. History: pain eighteen years; hæmaturia, eight years.
- (2.) Aged 37, five children. Last child eighteen months before death. History: one month.
- (3.) Aged 41, twelve children. History: two weeks.

Commonly associated with cystic disease of the kidneys and liver I find hypertrophy of the left ventricle and atheroma of the aorta and other vessels.

In 34 per cent. of my cases cardiac hypertrophy, and in 28 per cent. atheroma, were recorded.

In 8 per cent. pulmonary disease was present, and proved the cause of death.

Of Lejars' cases, in 25 per cent. cardiac hypertrophy, in 8 per cent. atheroma, and 7 per cent. pulmonary disease,

either pneumonia or phthisis are mentioned. Gout, rheumatism, and lithuria are not recorded often enough to afford a criterion. A history of alcohol is by no means uncommon.

In five cases out of 24, only one kidney was affected; the other kidney in four of the five was microscopically described as normal; in the remaining one it was granular.

In one case the left kidney was in a state of advanced cystic degeneration, while the right presented no abnormality to the naked eye, but microscopical examination revealed the existence of very early cystic change.

Lejars records three cases in which one kidney showed only two or three minute cysts, or was very much less affected than the other.

I have notes of six cases in which the liver only was affected by cystic change—in three the cysts were multiple; in three single.

From 1789 post-mortem records of the last five years at St. Bartholomew's Hospital, I have collected 303 cases of granular kidneys, in 61 of which the kidneys, one or both, contained simple retention cysts.

In these cases the ages are represented as follows:—

At 2 years (cysts said to be of congenital origin) .	1
15-20 years	2
21-30 "	1
31-40 "	3
41-50 "	19
51-60 "	16
61-70 "	17

So that in 52 out of the 61, or in about 86 per cent., the age is over 40.

This age incidence may be compared with that in the cases of cystic disease of the kidneys, where 15 out of 24, or 62.5 per cent., are over 40.

Out of the 61 cases I have collected, 46 occurred in males, or 76 per cent., and only 15 in females, or 24 per cent.

In the statistics of cystic disease of the kidney the percentage of cases in females was much higher—44 per cent. to 56 per cent. of males.

In 34 cases out of the 61 cases referred to, or 56 per cent., cardiac hypertrophy was present; in 44, or 73 per cent., atheroma of the aorta and other vessels was found; in 18 cases the joints were examined, and in 9, *i.e.* 50 per cent., well-marked gouty deposits were found.

SYMPTOMS.

In examining the details of a considerable number of cases of cystic diseases of the liver and kidneys, one cannot fail to be impressed by the fact that they may be broadly classified from the symptomatic point of view under three headings:—

I. Those in which the condition is a post-mortem discovery without the presence of any renal symptoms during life. In eight of the cases which I have collected the discovery was made post-mortem, and death was the result of bronchitis, pneumonia, or phthisis.

II. Those which prove fatal after a very short and sudden illness. In seven of my cases death occurred suddenly, and was in three instances due to cerebral hæmorrhage, in one to thrombosis of the femoral vein. In the remaining cases the patient died comatose.

III. Those which terminate after a period of illness, either of short duration or more frequently extending over many years, and have well-marked symptoms pointing to the organ affected.

This class of cases may be further subdivided into—

(1.) Those in which no abdominal tumour can be felt on physical examination.

(2.) Those in which a well-marked tumour on one or both sides is palpable. In twenty-one of my cases renal symptoms were present, twelve of which were accompanied by an abdominal tumour; in nine no tumour is recorded to have been felt on physical examination. In nineteen the duration of symptoms was from twelve years to five weeks; in two cases only a few days.

I have collected eight cases in adults in which cystic disease of the kidneys was associated with that of the liver.

In two the discovery was made post-mortem, and no symptoms pointing to either organ were present. Pulmonary disease was the cause of death.

In six there were symptoms referable to the organs affected, either pain, swelling, or the character of the urine.

The duration of symptoms was from ten weeks to twelve years.

In only one instance was jaundice mentioned as accompanying cystic disease of the liver, and that was a case of yellow fever, in which the kidneys were unaffected.

Comparison of the Symptomatology of (a) Lejars' cases, and
(b) those which I have Collected.

Kidneys.

	(a.)	(b.)
Total cases	58	38
I. Post-mortem discovery	16	8
	(25 per cent.)	(23 per cent.)
No renal symptoms.		
II. Sudden death	10	7
	(17.5 per cent.)	(20 per cent.)
Due to cerebral hæmorrhage	4	3
III. Renal symptoms	33	21
	(58 per cent.)	(58 per cent.)
Presence of tumour in	16	12
Duration of symptoms, 30 yrs. 1 mth.		12 yrs. 1 mth.
(1.) Long	27	19
(2.) Short	few days	few days
	6	2

Kidneys and Liver.

Total cases	16	8
I. Post-mortem discovery	5	2
No symptoms.		
II. Symptoms referable to } kidneys and liver	10	6
III. Duration of symptoms, 10 yrs. 2 mths.		12 yrs. 10 wks.

I will now pass on to the discussion of the symptoms most often associated with cystic disease of the kidneys and liver, especially those which would assist in arriving at a diagnosis.

The onset is, as a rule, insidious, and is characterised, in the majority of cases, by pain, often bilateral and radiating, situated in the lumbar region, and in the right hypochondrium, or epigastrium, if the liver is affected. It is not usually severe in character, but continuous, and subject to exacerbations of a colicky nature. It is common for the patient's attention to be first attracted by the appearance of a swelling on one or other side of the abdomen. In not a few cases hæmaturia is the first symptom.

Apart from these most common indications of the onset of the disease, the patient may complain of gradual failure in health for some months, and present a cachectic appearance without there being any definite symptom to assist in a diagnosis.

It is not uncommon for the onset, marked by one of the above-mentioned symptoms, to be dated from a severe injury, a

point on which Morgan has recently laid stress in his Lettsomian Lectures. In cases with a clear history all three symptoms may be present when the disease is well established.

Following the appearance of the first symptoms, whether it be pain, hæmaturia, or tumour, there is usually an interval in some cases of years before anything fresh occurs.

Lejars mentions a case in which a woman of 51 gave a history of pain in the side of eighteen years' duration, followed, after an interval of ten years, by attacks of hæmaturia, accompanied by œdema of the extremities. At this period tumours in both sides of the abdomen were noticed. These symptoms continued, and four months previous to her death the patient appeared very anæmic and cachectic.

Previous to her death the pain became worse; she had several rigors, and died from acute pulmonary œdema. Her urine contained much albumin, but no casts or blood while she was in hospital.

The last-named author also records the case of a woman, aged 38, in whom the first symptom was the appearance of an abdominal tumour, which, in the course of the next ten years, became much larger, accompanied by pain and nausea, and later by much wasting and pallor.

Death occurred after nephrectomy.

Hæmaturia occurring as the first symptom is usually repeated several times, and in the cases I have collected was never continuous. After some months it is followed by pain in the abdomen and the appearance of a swelling. It often seems to be the result of an injury. Œdema of the extremities and face has been remarked by Lejars in a few rare cases to be the first symptom, followed by headache, cramp, and vomiting. In some cases the onset is marked by other urinary troubles than hæmaturia, such as increased frequency of micturition, very scanty micturition, or even attacks of anuria.

Lejars mentions the case of a woman, aged 53, who for thirty years had had periodic attacks of anuria, with fever. Ten days before her death she was seized with pain in the abdomen and continuous vomiting. For the last six days of her life she had complete suppression of urine; the pain increased, and was situated on the left side. A tumour was discovered occupying the right side of the abdomen. Epistaxis occurred on the third day before death, and diarrhœa on the last day.

Another case recorded is that of a man, aged 38, who for some years complained of frequency of micturition; six months before death he suffered much from cramps in the legs and abdomen. Hæmaturia occurred four months later. Death was

preceded by headache, hæmorrhage from the gums, the appearance of a tumour on the left side of the abdomen, and œdema.

In a certain number of cases, after a quiescent period of some months, following the appearance of the first indication of ill-health, either pain, tumour in the abdomen, or more general symptoms, such as headache, anæmia, or wasting, a sudden change for the worse sets in, and in the course of the next week or ten days, after an attack of hæmaturia or epistaxis, the patient dies comatose.

In these chronic cases, accompanied by pain and the presence of an abdominal tumour, an acute fatal termination is ushered in in a variety of ways, either by hæmaturia and epistaxis, as above mentioned, or by persistent vomiting and headache, diarrhœa, or anuria in a few cases.

Exceedingly interesting and remarkable are those cases in which, without any previous history of renal disease whatsoever, the patient dies after a few days' illness. Yet post-mortem examination reveals the strange fact that the kidneys have been the seat of disease for a long period. I have notes of several such cases. One recorded by Dr. Pye Smith in the Pathological Society's Transactions, vol. xlv., is that of a man who was in good health until fourteen days before death, when vomiting and diarrhœa set in; he became comatose for the last four days of his life, but had no convulsions. He had albuminuric retinitis, and his urine contained a small amount of albumin. In another instance, a man, aged 29, while in apparent good health, was seized with faintness, dyspncea, and vomiting, and died in five days. Lejars mentions a few cases in which patients suffering from some chronic lung disease are suddenly seized with dyspncea or become comatose, and die in one or two days. I have collected three cases, and Lejars mentions four, in which patients have died comatose after thirty-six or forty-eight hours from the effects of cerebral hæmorrhage, whose kidneys, on post-mortem examination, are found to be in a condition of cystic disease.

In the cases of cystic disease of the kidneys of obviously congenital origin which I have collected, the ages were ten months, ten weeks, and four weeks. The symptoms were those of acute nephritis, in addition to a bilateral abdominal tumour. There was general œdema in all three cases, and in one ascites was present. In each instance, the urine, when boiled, became solid with albumin. There was no enlargement of the liver felt, nor was there jaundice. All died of uræmia.

Post-mortem, there was found cystic disease of both kidneys, and early cystic disease of the liver in each case. Symptoms

pointing to the liver, when the seat of cystic disease, are conspicuous by their absence. In only one case, which I have already mentioned, is jaundice recorded. The fæces are not abnormal, nor the urine stained with bile pigment.

Raymond Johnson, in the beginning of this year, described an interesting case in which cystic disease of the kidneys and liver was found.

It was that of a woman, aged 53, who had had attacks of hæmaturia twelve and four years ago. For the last five months she had suffered from repeated vomiting after food and progressive emaciation. On examination, each kidney could be felt as a large lobulated tumour. There was no apparent enlargement of the liver, and no jaundice.

The urine contained 120-135 grains of urea in the twenty-four hours, instead of the usual quantity, 500 grains. The amount passed in twenty-four hours was 25-35 oz. Its specific gravity was 1010, and there was a trace of albumin present.

Death was sudden; there was no coma, and no convulsions.

The notes of a case which I had the opportunity of observing in Luke Ward, at St. Bartholomew's Hospital, while clerking for Dr. Gee, are worth quoting, and are recorded here with Dr. Gee's kind permission.

The patient was a man, aged 49, who, four years previously, had been successfully operated on for stricture. External urethrotomy was performed.

Three and a half years later, in December 1896, *i.e.* seven months before death, he had an attack of renal colic.

In January last year he was admitted to the Hospital with albuminuria and pyuria. In the left lumbar region there was found to be pain and resistance. Later, after his discharge, he lost flesh rapidly and had much sweating; micturition was very frequent.

In the middle of July he had an attack of hæmaturia and great pain in the left side; a few days after he was admitted to Luke Ward; he was then very pale and cachectic. His abdomen, though not distended, presented a fulness in the left flank. There was great tenderness to palpation, and resistance on both sides. Under chloroform, a large and slightly movable tumour could be felt in the left renal region. The diagnosis of pyonephrosis resulting from stricture was then made. His urine was very scanty, only 5 oz. in twenty-four hours, and contained much pus and albumin, but no blood. Twelve hours before death it contained 12.5 grains of urea in the preceding twenty-

four hours. Epistaxis occurred three days before death. He gradually became drowsy. Respiration was laboured, and he died comatose seven days after admission.

Death occurs rapidly or slowly. When the termination is rapid, it is produced in a few days, or even a few hours, from the onset of grave symptoms, and may be due to acute uræmia or cerebral hæmorrhage. In twenty-four of my collected cases the nature of death was recorded; in eleven of these it was due to an acute uræmia, which most often took the form of coma; but in one case, that of epileptiform convulsions, and in another, in which post-mortem the liver was only found to be cystic, mania.

In five instances it was due to cerebral hæmorrhage, and the patient died comatose. When occurring more slowly, it follows marasmus, often complicated by pulmonary lesions.

Pulmonary disease was apparently the cause of death in three of my cases, who suffered from bronchitis, phthisis, and chronic interstitial pneumonia respectively, in addition to cystic disease of the kidneys. In two cases there was marked cachexia. In one case death was apparently due to cellulitis of the arm, and in another to thrombosis of the femoral vein.

Lejars makes a summary of the causes of death in the cases which he has collected as follows:—

	Cases.
Uræmia	26
Cerebral hæmorrhage	4
Marasmus	3
Pneumonia	3
Bronchitis	2
Phthisis	4

Vomiting and dyspnœa are frequently met with, associated with uræmia.

Whipham records two cases in which death took place quietly, the patients retaining their intelligence to the end.

PHYSICAL SIGNS.

A patient whose kidneys, whether associated with the liver or not, are the seat of cystic degeneration, usually, but not always, presents a marked cachectic appearance, as was the case with the man under Dr. Gee's observation at St. Bartholomew's Hospital. Apart from the wasting and pallor and abdominal tumour, the signs are frequently those of chronic interstitial nephritis.

Ophthalmoscopic examination of the eyes may reveal albu-

minuric retinitis, as was present in the case I have already referred to, described by Dr. Pye Smith. The breath is foul and "urinous," the tongue thickly coated.

The respiration is deep, slow, and somewhat laboured, and there may even be attacks of dyspnoea, especially a short time before death. The dyspnoea resembles the so-called "nocturnal asthma," so common in chronic Bright's disease. It may be a manifestation of pulmonary complication.

A general increase in the blood pressure is evidenced by hypertrophy of the left ventricle—less frequently accompanied by dilatation of the right ventricle.

This becomes clear on physical examination of the chest, when displacement of the heart's apex beat outwards and an increase in the area of cardiac dulness are observed.

Together with cardiac hypertrophy, atheroma is very frequently to be noted, and evidence of this is found in the heightened tension of the pulse and the thickened and hard radial and temporal arteries. To the cardiac hypertrophy and atheroma, Lejars attributes, with some justice, the numerous hæmorrhages associated with cystic disease of the kidneys; foremost in importance of which he mentions cerebral hæmorrhage, also epistaxis, often profuse, retinal hæmorrhages, hæmorrhage from the gums, hæmaturia, and intestinal hæmorrhage.

In eleven out of thirty-two of my collected cases cardiac hypertrophy was found, and in nine atheroma of the aorta or vessels.

In sixteen out of fifty-seven of Lejars' cases there was mention of cardiac hypertrophy, and in seven atheroma was recorded.

To physical examination of the abdomen must be attached great importance for and in the diagnosis. Unfortunately, in many cases, including the one under Dr. Gee's care, which I have already mentioned, great tenderness and the resistance of the firmly contracted abdominal walls prevent close examination, and consequently one is deprived of the useful assistance of palpation.

On inspection of the abdomen, there may be noticed obvious distension, general or local.

On palpation, the liver may be felt enlarged, and if the seat of advanced cystic change, irregular bosses may be palpable through the abdominal wall, on the liver surface, or along its edge below the right costal margin. It may be possible to get fluctuation in the larger of these prominences, due to the fluid in a large superficial cyst. In some cases of cystic disease of the liver no enlargement at all is found. Palpation of the flanks does not always reveal the presence of a tumour on each

side, possibly owing to excessive tenderness on the part of the patient.

Where tumours in both renal regions are distinctly felt, and especially if, on careful examination, the surface of each tumour is found to be irregular, bossed, and to present fluctuating points, the diagnosis is materially assisted.

Courbis mentions a case, published in an article on cysts of the liver and kidneys in 1877, in which the patient, aged 62, had had a tumour for four years occupying the epigastrium and right hypochondrium. On physical examination, all but the left side of the abdomen was found to be taken up by a very large tumour, whose surface was uneven, bossed, and bore fluctuating nodes not communicating with each other.

Besides these well-marked physical signs there was considerable ascites, a rare complication of the disease.

There was no jaundice, and the urine and fæces were normal.

His appearance and the duration of the tumour eliminated cancer. Puncture of the cysts and examination of the fluid excluded hydatid disease. Courbis fails to mention the diagnosis arrived at.

Hindrances to satisfactory palpation may be removed by anæsthetising the patient. Even when this has been done, it is not always possible to decide that the tumour is bilateral. In many cases, however, the kidneys are felt to be much enlarged, and the irregularity of their surface can be distinguished. The tumour in either flank is frequently found to be movable, extending from the lower costal margin down to the iliac crest, and anteriorly almost to the umbilicus. This was so in one of my collected cases. The size of the tumour was compared to that of the foetal head.

Examination may be complicated by the presence of much ascites, or intestinal coils distended with fæces or flatus.

On percussion of the abdomen, if the liver be affected the hepatic dulness proves to be much increased downwards so as to invade the greater part of the epigastrium and right hypochondrium.

The percussion note in the flanks, too, is dull to the outer side, but possibly resonant more towards the middle line where the tumour is crossed by the ascending and descending colon on either side respectively.

The dulness is fixed, and does not alter on the patient assuming the lateral position.

Lejars mentions one or two instances in which there was localised œdema, and redness in the flank due to perinephritic abscess produced by rupture of a cyst into the cellular tissue.

Examination of the urine is of considerable interest and importance.

As I have already mentioned, the urine frequently contains blood; not usually for any length of time together, but often at intervals of some weeks, and in many cases only once, and that a short time before death.

Lejars states that there is more often polyuria than anuria, but in several cases of which I have notes, and in the case under my observation, there was suppression of urine.

I should feel inclined to say that polyuria is common in the early, anuria in the later, stages.

The specific gravity of the urine is nearly always low, about 1010 to 1015. The reaction is acid. Albumin is present in almost every case; its amount is usually not more than a trace, but in some instances may rise to one-fourth, as in my case, or even higher. In two cases of obviously congenital origin, where death occurred in the fourth and tenth weeks of life, the urine was almost solid with albumin.

Pus is found in a few cases, and granular or epithelial casts in the more acute. The amount of albumin seems to depend directly on the acuteness of the case. Estimation of the quantity of urea is of interest, and even value in some cases. In every instance in which this was carried out among my collected cases, the amount has been considerably below normal—about one-fourth or one-third of the proper quantity.

In the case under Dr. Gee's care, on estimation twelve hours before death, I found that the patient had only passed 12.5 grammes of urea in twenty-four hours, instead of the normal amount, 33 grammes.

The characters of the urine found in cystic disease of the kidney closely resemble those in chronic interstitial nephritis. Thus, the amount is often excessive, the specific gravity is low, and not more than a trace of albumin is usually present. These facts on the examination of the urine are well borne out both by my own and Lejars' collected cases.

DIAGNOSIS.

The diagnosis of cystic disease of the kidneys is often exceedingly difficult; for, as I have already stated, it may exist for many years without giving rise to any symptoms, and then suddenly declare itself and prove fatal in a very short time.

In some cases there may be general symptoms, such as wasting, pain, or dyspepsia, but none pointing to the source of trouble. In other instances, again, one of the chief symptoms,

especially the presence of an abdominal tumour, may predominate over the others, and render the diagnosis very difficult.

On what facts, then, can one most depend in arriving at a diagnosis?

Firstly, *The history and symptoms.* A history of repeated attacks of hæmaturia, constant pain in the lumbar region, associated with the existence of a swelling on both sides of the abdomen of some duration.

Secondly, *Physical examination.*

(1.) Of the abdomen:—This may reveal the presence of a bilateral tumour. If its surface is found to be bossed, irregular, and to present fluctuating nodes, the diagnosis is materially helped.

(2.) Of the urine:—Low specific gravity, a trace of albumin, diminution in the amount of urea, and polyuria, favour the conclusion, as also does the evidence of blood.

Thirdly, *The patient's general condition.* Anæmia, œdema of the extremities, evidence of hypertrophy of the left ventricle, and a pulse of raised tension, are by themselves not of great value, but, together with the above-mentioned features, assist one in forming an opinion.

Without the discovery of an abdominal tumour it is quite impossible to make the diagnosis, and one may almost say the diagnosis of cystic disease ought not to be made.

The importance of ascertaining that the tumour is bilateral I will mention shortly.

I will briefly consider the differential diagnosis.

Cystic disease of the kidney must be distinguished from:—

(1.) *Hydronephrosis.*—This is characterised by a large, usually unilateral, tumour, rounded, smooth, and fluctuating, and bulging the anterior abdominal wall. It is associated with a history of urinary trouble, attacks of renal colic, and presence of calculi or gravel in the urine. There are periods of anuria, during which the tumour increases in size, and polyuria, when it subsides.

(2.) *Pyonephrosis.*—This condition is quite capable of giving rise to a tumour, not unfrequently bilateral, and often bossed and fluctuating. Here the state of the urinary passages, *e.g.* the presence of stricture, the pyuria rigors, fever, and cachexia, associated with long-continued suppuration, indicate the probable nature of the case.

In connection with pyonephrosis, I again refer to the case under Dr. Gee's observation in St. Bartholomew's Hospital, which I have already described.

This patient, a man aged 49, four years previously had been

treated for stricture of the urethra. When admitted to the Hospital in July 1897, he had albuminuria and pyuria, and presented a very cachectic appearance, as though due to long-continued suppuration. There was evidence of a bilateral tumour in the abdomen, associated with much pain.

These facts certainly pointed to the probability of pyonephrosis, and this was the diagnosis arrived at.

But post-mortem examination showed both kidneys to be in an advanced state of cystic degeneration. The pelves of the kidney were almost obliterated, the ureters patent and of normal calibre; the bladder was slightly hypertrophied, and the urethra admitted a No. 10 catheter.

(3.) Hydatid cysts of the kidney, especially if associated with hydatid disease of the liver, sometimes render the diagnosis difficult. Hydatid disease of the liver is occasionally multiple, but the cysts are much larger, more tense and prominent than those in cystic degeneration of the liver.

Exploratory puncture, and the discovery of hydatid fluid with its well-known characters, confirm the diagnosis of hydatid disease.

(4.) *Malignant growths which have become cystic.*—These may affect both kidneys, but do so rarely. The history is of much shorter duration, and is characterised by profuse and frequent hæmaturia and very severe pain in the lumbar region. Malignant disease is accompanied by marked and usually rapid emaciation, and secondary deposits of new growth.

(5.) One of the cysts on the surface of the kidney which is the seat of cystic degeneration may become abnormally developed, and resemble a simple cyst of the kidney, and thus hinder proper physical examination of the abdomen.

(6.) Cysts of the ovary and malignant growths in the pelvis should be mentioned as occasionally to require differentiating.

The importance of diagnosing cystic disease of the kidney, and especially of ascertaining that the tumour is bilateral, cannot be over-estimated.

There are cases on record in which only one kidney was felt to be enlarged, and was consequently removed by surgical operation, under the belief that its enlargement was due to malignant disease or pyonephrosis. Instead, the kidney has been found to be the seat of cystic disease.

A rapidly fatal termination has followed, and on post-mortem examination the other kidney, though not palpable during life, has been found enlarged and in a state of cystic degeneration.

I have notes of five cases in which the diagnosis of cystic disease of the kidney has been made; four left the Hospital

somewhat relieved by rest and careful diet. On one of these four the operation of nephrectomy was performed—a good recovery followed. The kidney removed is described as composed of a number of small cysts. The fifth case is at present in hospital.

The history which these patients gave of hæmaturia, pain, and lumbar swelling, the discovery of a bilateral or unilateral tumour, the characters of the urine, which I have mentioned, all pointed to the probable accuracy of the diagnosis. I have in one instance been able to obtain the subsequent history.

The patient, a man aged 47, was admitted into St. Bartholomew's Hospital in December 1896, with a history of dull aching pain all over the abdomen during the past year, lately becoming localised to the right loin, and of a shooting character.

Micturition had of late been increased in frequency, but at no time had he noticed blood, pus, or gravel in his urine. Abdominal examination revealed the presence of a bilateral movable tumour, dull to percussion; no enlargement of the liver was found; the urine was acid; its specific gravity was 1018; it contained a trace of albumin, and only 1.4 per cent. of urea instead of the normal percentage of 2.3 to 3.2.

Cystic disease of the kidneys was diagnosed, and he was discharged ten days after admission. I have only lately heard from this patient that his health has been much improved by a quiet life in the country, and that he has gained a stone in weight in the last year. The dull heavy pain in the loins has become worse, and is continuous; the swelling on the left side has increased in size, that on the right has remained stationary. The urine is normal in amount; has *never* been blood-stained. He has had no œdema of the extremities.

PROGNOSIS.

The diagnosis made, a word as to prognosis. This, without doubt, cannot fail to be grave. Much uncertainty is attached to the future course of the disease. The patient, if at the time in apparently fair health, may live for some years, yet, on the other hand, he may die quite suddenly of acute uræmia, some intercurrent disease, or cerebral hæmorrhage.

If a definite prognosis can be given in any case, it would seem to depend on the following facts:—

(1.) *The age of the patient.*—The nearer 50 the worse is the prognosis.

(2.) *The general condition of the patient.*—The absence of

cachexia, anæmia, of pulmonary and cardiac disease, and of any of the more acute symptoms, improves the prospect.

A patient whose pulse tension is not high, whose arteries are not thickened, and whose left ventricle is not greatly hypertrophied, has a better chance of life.

(3.) *The character of the urine.*—The prognosis is more favourable if the patient does not suffer from attacks of anuria—if pus and blood are absent, and if there is no great diminution in the amount of urea passed daily.

To this last point I would attach some importance.

(4.) *Medical treatment.*—This should be the same as that of an ordinary case of chronic interstitial nephritis, summed up by careful dieting and hygiene. It is, moreover, of the greatest importance to endeavour to prevent disorders of every kind, and especially those which affect the kidneys.

MORBID ANATOMY OF CYSTIC DEGENERATION OF THE KIDNEYS AND LIVER.

I. *Macroscopic Appearance of*

1. *The Kidneys.*—I will first attempt to describe the kidneys from a case of congenital origin.

Both kidneys are found usually to be more or less equally enlarged. Their shape is considerably altered, and has become almost rounded and globular. The longest diameter measures 4 inches, and the weight is nearly 1 lb. instead of only being 1 oz.

The surface is smooth, and beneath the capsule are seen a number of round transparent cysts, not projecting beyond the surface, and of all sizes up to that of a pea.

On section, the substance of the kidney is found to be riddled by small cysts, none usually much larger than a pea, not communicating with one another, and separated by fine septa of connective tissue and remains of renal tissue.

Some observers have remarked that the cysts of the pyramids are larger than those of the cortex. The pelvis and calyces are often quite normal, and the ureter is pervious and of normal calibre. The bladder is also natural.

The cystic kidney of adults varies considerably in size, apparently according to the stage of the disease.

I have seen specimens of all sizes between once or twice to six or seven times the normal size. The weight varies equally from about 20 oz. each to 132 oz. for the left and 73 oz. for the right kidney, the largest I have met with in my collected cases.

The length ranges from between 5 inches to 10 or 12 inches, the breadth from 3 to 5 inches. The size of the two kidneys is usually unequal, as though one were in a more advanced state of degeneration than the other.

The surface of the cortex is seen to be composed of innumerable cysts of all sizes, ranging from that of a pea to that of an orange in some instances, and presenting very irregular and bossed projections.

On section, the same condition exists, and the whole substance of the kidney is completely riddled with cysts, usually of a larger size in the cortex than in the medullary portion.

The majority are transparent, filled with a clear light yellow fluid, others are rendered quite opaque and dark by the presence of dirty brown or thick green material; in some cysts the fluid is semi-purulent, with the odour of decomposing urine.

The cysts do not communicate with one another, and are enclosed by septa of connective tissue of varying thickness. On close inspection of the septa, numerous minute cysts the size of a pin-point may be seen. To the naked eye in an advanced state no remains of healthy renal tissue are discernible.

The pelvis is, as a rule, almost entirely obstructed by the cysts, but in some cases has been found dilated.

In all the specimens which I have seen the ureters were pervious and of normal calibre, and the bladder and urethra usually healthy.

Less advanced conditions of cystic degeneration are occasionally, though rarely, met with, in which the cortex of one kidney only is transformed into a number of cysts, while the medulla is very much less affected and still contains some healthy tissue. The other kidney may present only a few cysts in its cortex, and otherwise appear normal.

This is a stage in the disease to which there attaches some importance, and I shall refer to it again later.

2. *The Liver.*—In congenital cystic disease the liver may present no enlargement, and show no traces whatever to the naked eye of cystic change. In some cases, however, there is evidence of an increase in the amount of fibrous tissue, and small cysts can be seen.

In the adult form there is almost as much variety in size and appearance to be met with in the liver as in the kidney.

It may be of normal size, but puckered and deformed, or be so enlarged as to weigh three or four times the natural weight.

The convex surface is usually studded with numerous transparent cysts of various sizes, from that of a pea to a walnut.

Section of the liver reveals the presence of cysts in greater quantity, not communicating with one another, well defined, and separated by apparently healthy tissue.

The amount of connective tissue is nearly always greatly increased; the increase presents well-defined patches, localised in the neighbourhood of the cysts.

The contents of the cysts are either a clear thin albuminous fluid, or straw and chocolate-coloured; in none of the cases which I have collected was it bile-stained.

*Post-mortem Appearances of other Conditions of the Kidneys
in which Cysts occur.*

1. *Cysts due to Simple Retention.*—Cysts are very frequently found in a kidney the seat of chronic interstitial change. They are most commonly situated in the cortex, and are of two varieties.

(1.) The small multiple cysts, usually no larger than small shot, and freely studded over the surface of the cortex underneath the capsule. They contain clear light yellow fluid, and, in one specimen I have seen, many of the cysts were filled with minute rounded calculi.

Their number varies from two or three to as many as fifty.

(2.) The large, usually single, cyst varies in size from that of a pea to a walnut, and may be present to the number of two or three in the same kidney. It is commonly situated in the cortex, but may occur in the medulla.

The contents of the large cyst present much variety, but are usually clear light yellow urinous fluid. I have seen specimens in which thick dark green material filled the cyst; in one the cyst contained a calculus, in another caseous crystalline material composed of cholesterin and uric acid.

The two forms of cysts may be present in the same kidney.

I have collected notes of 61 specimens. In 41 the small multiple variety was present, in 25 the large single form occurred.

The kidney in which these cysts occur is usually granular, the cortex is diminished in thickness, and the capsule peels badly. This was the case in 41 of the specimens, notes of which I have collected, or 68 per cent. In three instances uratic deposits were found in the papillæ; in three calculi were present.

Associated with this condition of the kidney the following facts are of interest for purposes of comparison with similar details in connection with true cystic disease of the kidney.

Out of the 61 cases, in 34 instances, or 56 per cent., there was well-marked hypertrophy of the left ventricle of the heart.

In 44 instances, or 73 per cent., there was atheroma of the aorta and vessels, and in 2 cases aneurysm of the arch of the aorta.

In 19 instances, or 31 per cent., the valves were unhealthy.

In 13 instances, or 21 per cent., there was marked atheroma of the cerebral arteries.

In 8 instances, or 13 per cent., there was evidence of recent (in 6) or old (in 2) cerebral hæmorrhage.

In 18 cases the great toe joints were examined, and in 9, or 50 per cent., uratic deposits were found.

I have already mentioned the changes found in the heart and vessels associated with true cystic disease of the kidney, but will briefly repeat those noted in my collected cases.

In 34 per cent. hypertrophy of the left ventricle was recorded.

In 28 per cent. atheroma of the aorta or vessels was present.

In 12.5 per cent. cerebral hæmorrhage occurred.

The large serous cysts occasionally, but rarely, found in connection with the kidney, are instanced by two specimens which I have seen.

In the first, the cyst contained a pint of clear fluid, but none of the urinary constituents; the right kidney lay behind it, its anterior surface forming part of the cyst wall; the ureter was tortuous and elongated, had no communication with the cyst, but passed along its wall.

Towards the inner part of the cyst was a small soft body the size of a walnut, which projected into the cyst, and proved to be a third kidney. It was composed of a single lobe, consisting of perfect cortex and tubules, but possessing no excretory duct. In the second specimen, a large cyst, holding four pints of yellow, alkaline, albuminous fluid, was developed from the pelvis of the kidney, situated behind it. A second cyst, containing half a pint, opened into the first. The ureter was patent.

Certain tumours of the kidney may undergo cystic change or develop as cystic neoplasms.

I have the notes of two such cases, one described by W. Edmonds in the Pathological Society's Transactions, 1892.

The patient was a girl, aged 18, who had had a movable tumour in the left lumbar region for two years.

Nephrectomy was performed, and the kidney found to be the seat of a globular tumour, $2\frac{1}{2}$ inches in diameter, projecting from its anterior surface. The growth was definitely encapsuled, and composed entirely of cysts of different sizes, the largest 1 inch in diameter. The cysts contained thin colourless fluid, and were lined by cubical and columnar epithelium.

Its origin may have possibly included remains of the Wolffian body. The rest of the kidney was normal. A good recovery followed.

The second case is that of a child aged 10 months, on whom nephrectomy was performed.

The kidney was partly occupied by a tumour projecting from the outer border and pushing the cortex to one side. The tumour was well defined by a capsule from the rest of the kidney.

On microscopical examination, the structure of the growth was glandular, many small alveolar cysts lined by cubical epithelium, and some packed with cells. Here and there the cysts had ruptured, and the glandular tissue infiltrated the surrounding connective tissue. No intracystic growth could be seen.

The child died eleven months later of a recurrence of the growth. The growth is described as a congenital cystic adenoma.

These forms of cystic growth require to be differentiated microscopically from kidneys in a state of cystic degeneration. The origins of the two are altogether different.

*Cysts found in the Liver apart from Cystic Degeneration
(not including Parasitic Cysts).*

1. Simple or serous cysts (non-parasitic) are very rare, usually large, smooth-walled, and well defined. There are two specimens in the museum of the Royal College of Surgeons.

(1.) A cyst 6 inches in diameter attached to the lower edge of the liver. The capsule passes over the cyst; its wall is composed of fibrous tissue undergoing colloid degeneration. The cavity is traversed by cords and membranes.

Contents: straw-coloured alkaline fluid, containing albumin and chlorides.

(2.) Thin-walled cyst, $2\frac{1}{2}$ inches in diameter, attached to the anterior margin to the right of the gall-bladder. Its lining membrane was quite smooth.

The origin of these cysts is doubtful; some have attributed them to dilated lymphatic passages which have become obstructed; others to the development of obstructions at the commencement of the bile ducts; others again consider them to be sterile hydatid cysts.

2. Multiple cysts may be present in the liver as the result of obstruction to the biliary passages, from dilatation of the blocked ducts. The cause of this obstruction may be new growth of

the wall, or pressing on the wall, or cicatrisation following inflammation or impaction of a biliary calculus.

Cysts of the liver arising in the course of cirrhosis are considered as due to dilation of either the original bile ducts, the result of obstruction by the increase in fibrous tissue, or dilatation of bile ducts of new formation. It must, however, be remembered that it is doubtful whether such new formation ever actually occurs.

The cystic change in these cases is usually localised, and only found near the surface of the liver.

The surface is irregular and granular, and in some instances section reveals many small cystic spaces.

The contents of the cysts, when the result of obstruction to the original bile ducts, are composed of inspissated bile or gelatinous material. The walls are smooth-walled and lined by cubical epithelium.

3. Tumours of the liver which become cystic must be distinguished from cystic degeneration of the organ. Some authors have caused confusion by describing the latter as due to adenomatous change or as mucoid epithelioma.

These tumours are cystic epithelioma and adenoma; the former is a secondary occurrence, and the primary source may be found in the rectum or elsewhere.

The growth may be composed of well-defined cysts, with thick walls, separated by small pale masses which have not become cystic.

In a specimen which is in the College of Surgeons' Museum the primary growth was a subcutaneous tumour, also cystic.

Cystic adenoma is supposed to arise from epithelial cells of the liver, or the intra-hepatic bile capillaries, and is associated with the formation of cysts.

This tumour tends to resemble true cystic degeneration of the liver, but is usually more localised.

Sabourin considers the cysts to be formed from trabeculæ of liver tissue, which undergo change and acquire functional epithelium, and thus become adenomatous.

THE MICROSCOPICAL APPEARANCES OF THE KIDNEYS AND LIVER IN THE STATE OF CYSTIC DEGENERATION.

I. *The Kidneys.*

Under the microscope sections of the congenital form which I have examined show that almost all the kidney substance has

undergone cystic change. Even those parts which to the naked eye appear healthy are in the early stage of disease.

This cystic change, almost everywhere manifest in different degrees, is seen to consist in a dilatation of the renal tubules, which eventually results in the formation of large cystic spaces. In places normal and undilated tubules can be found. From the apparently healthy secreting structure all intermediate stages are seen up to the well-formed cyst.

The first stage is represented by the slightly dilated tubule lined with well-formed cubical epithelium; the intermediate stage, by the tubule still more dilated, but with its epithelium becoming less cubical and more flattened. In a more advanced condition the dilated tubule has become a well-formed cyst; its epithelium is quite flattened and of the polygonal pavement form, and is frequently separated off, so as to occupy the cavity of the cyst; the lining epithelium presents different appearances according as it is seen on the flat, when its mosaic pattern is quite obvious, or on section, when it is seen as a string of flat nucleated cells. Cysts of older date are distinguished by their larger size, the absence of a lining epithelium, and their walls being definitely fibrous.

The glomeruli, as a rule, appear fairly normal, but in places have become compressed. In between the cysts and dilated tubules there is evidence of a considerable amount of inflammatory change, shown by the great increase in the cellular elements of the interstitial tissue. In some parts this has become more marked than in others, especially around the larger cysts, but there is clear evidence of interstitial increase around the merely dilated tubules.

The kidney substance in a specimen I examined was very much congested, and in cases hæmorrhages had occurred into the intertubular tissue. Some of the otherwise healthy tubules contained epithelial casts. In a second specimen it was obvious that the cystic change was more advanced in the pyramids than in the cortex,

The adult form of the disease shows microscopically much the same changes as I have attempted to describe in the congenital form, but the condition is in a more advanced stage.

The cystic spaces are considerably larger, occupy a much greater part of the section, there are fewer remains of apparently normal tissue, and it is not so easy to trace the formation of the cysts to the different stages.

The increase in the amount of connective tissue is more obvious, it is much less cellular, but invades nearly all parts of the section, surrounding healthy and dilated tubules alike. It

is more conspicuous round the larger cysts, whose outline is in some places circular, in others angular, owing to compression of neighbouring cysts. Many of the dilated spaces are in the process of atrophy, and have become flattened from the encroachment of adjoining ones. The majority of large cysts have a well-formed fibrous wall; the epithelial lining has disappeared, or has been shed into the cavity of the cysts. In the cyst wall are frequently seen atrophied remains of renal tubules. From the appearance of the larger cysts, it is obvious that many have increased in size by fusion of adjoining spaces after rupture of the intervening walls. For in several there can be seen strands of fibrous tissue, in some cases lined on each side by flattened epithelium, projecting into the cavity of the cyst with a free unattached end. Elsewhere the trabeculæ of fibrous tissue are exceedingly fine in between adjoining cysts, some of which present a definite *cul-de-sac*. In places normal renal tubules can be seen capable of active secretion, in other parts the tubules are slightly dilated, but their lumen is completely obstructed by shed epithelium and granular debris.

The arteries in a great many instances show definite signs of sclerosis, and the glomeruli are frequently compressed, atrophied, and definitely encapsuled by fibrous tissue.

This, however, is not always to be observed. The changes observed in the adult kidney altogether represent a more chronic form of disease than do those noted in the congenital kidney, where the condition seems to be acute.

Nowhere could I discern vacuolation of the epithelial cells, cystic change affecting the glomeruli, or the presence of adenomatous growth, described by different observers as the origin of the cysts.

II. *The Liver.*

Contents of Cysts.—Blood cells, epithelium cells, urea, albumin, salts; in some cases cholesterin, calcium, oxalate, leucin, and creatinin.

The specimens which I examined of congenital cystic disease presented to the naked eye no apparent change, but microscopically the early stage of cystic formation seen was exceedingly interesting.

The changes observed were those of typical biliary cirrhosis up to a certain point, at which the cystic change commenced.

The sections showed on the field of the microscope well-defined patches of altered tissue to the number of two or three in the same field. These patches were composed of (dense,

almost non-cellular) fibrous tissue surrounding what was presumably a well-formed bile duct lined with columnar or cubical epithelium.

This increase of fibrous tissue round the bile ducts, which was everywhere visible, showed clearly the existence of inflammatory change originating in the bile ducts—a chronic cholangitis.

The calibre of these apparent bile ducts was not everywhere the same; many showed a well-marked dilatation lined by the cubical cells. The number, too, of the bile ducts was much increased above that seen in a section of normal liver tissue. The patches of fibrous tissue varied in size, and the larger ones contained many of the so-called bile ducts, some of normal calibre, others dilated and irregular in outline. There could also be seen in several of the fibrous patches double rows of epithelial cells with scarcely any lumen at all, such as are frequently seen in ordinary cirrhosis of the liver.

The increase in the fibrous tissue and the proliferation of the bile ducts were not confined to the portal canals, but the fibrous nodules were found distributed throughout the liver tissue wherever the bile ducts occurred, and under the capsule. Sabourin attributes this proliferation of the bile ducts to a new formation, depending on the transformation of trabeculæ of hepatic cells, and asserts that the new bile ducts are formed quite independently of the original ones.

In the portal canals, where distinguished, the vein and artery were of normal calibre; in one specimen I examined, the liver substance was much congested, and in places small hæmorrhages had occurred. Nowhere could intercellular fibrosis be seen. There was no tendency for strands of fibrous tissue to penetrate from the fibrous patches between the lobules.

The further changes from the dilated bile ducts of new formation to the well-formed cysts is better seen in the adult liver.

Here every stage has been observed, from the early dilated bile duct lined with cubical or columnar epithelium, to the cyst surrounded by dense fibrous tissue and lined by epithelium which has become flattened and pavement-like.

The intermediate stage Sabourin has compared to an angiomatous formation, and has termed it biliary angioma.

I have only examined one specimen of the adult cystic liver, and that was from a case described by Dr. Bristowe in 1856.

Unfortunately, the specimen was too old to throw any light as to the origin of the cysts, all of which had lost their lining epithelium, and merely presented spaces in the liver tissue sur-

rounded by fibrous tissue; but there seemed to be a great deal of cirrhotic change, extending even among the cells.

When the cystic condition has passed beyond the stage of merely dilated bile ducts, large irregular cavities are formed, some lined with the flattened epithelium; others, whose lining has been shed, are surrounded by a wall of dense fibrous tissue, in which can occasionally be seen remnants of new or original bile ducts.

As in the kidney, so here, the large cysts clearly increase in size by fusion of adjoining spaces after rupture of the septa, and present remains of the septa as loose strands of fibrous tissue, attached only at one end, projecting into the cavity of the cyst. These strands may be lined on both surfaces by flattened epithelium. In no case have I found it described that the cysts had any connection with the large bile ducts.

Around the large cysts are sometimes seen a number of smaller ones, either atrophied or in process of dilatation. In the contents of the cysts I have already described microscopically, shed epithelium completely blocking the lumen can be seen.

In the specimens I have examined I could nowhere discern vacuolation of the cells, to which Pye Smith attributes the origin of cysts.

A final stage in the history of the cysts has been described, in which the contents become more and more viscid, and in time are completely organised into a mass of fibrous tissue. The fibrous tissue thus formed by gradual contraction draws in the surrounding hepatic tissue, so that the hepatic lobules become elongated fusiform, with their long axis at right angles to the original cyst.

PATHOLOGY.

In the introduction to this subject I have already briefly described the various theories which have been suggested to account for the cystic transformation of the kidneys and liver.

I will now endeavour to discuss them in more detail.

I. *The Kidney.*

For some time there have been two theories most in vogue to account for the origin of the cysts, and both have been equally upheld by eminent pathologists. They have been termed the Retention theory and the Neoplastic theory.

1. *The Retention Theory.*—Foremost among the causes of retention has been placed chronic inflammation, to which a

great many attribute the true origin of the cysts. This theory has met with support from Virchow, Arnold, and more recently Rolleston.

By retention is meant the accumulation of the products of secretion in the renal tubules behind an obstruction at some point in the course of the tubule. The commonest cause of this obstruction is inflammation or its results.

To account for the congenital form of the disease, Virchow has described an atresia of the uriniferous canaliculi in the papillæ produced by an intrauterine interstitial process, or blocking of the tubules with uric acid or solid casts of albumin. He considers the adult cystic kidney to be due to congenital atresia in which the atresia has not been complete or affected all the papillæ. Consequently sufficient renal tissue has been left behind to carry on the work of secretion.

This theory meets with some support from Arnold, who had demonstrated the existence of foetal nephritis, the interstitial changes being most marked in the pyramids. The fact that microscopically the cysts occurring in the pyramids in the congenital cystic kidney have in some instances been found to be of larger size than those in the cortex, also lends some support to the view.

For the actual obstruction, due either to the increase of the interstitial tissue compressing the lumen of the tubes or to blocking of the lumen with inflammatory products, will obviously give rise to a greater dilatation on the part of the tube nearest the obstruction than of that more remote.

Furthermore, it is exceedingly common for death to result shortly after birth, and this would seem to indicate that the process was local, and one causing obliteration of the ducts at a point where they all come together before opening into the pelvis, rather than farther back, where the tubules are more widely separated, and therefore less likely to be subject to rapid and universal obliteration. There is microscopical evidence that the process is a local one.

But this theory, though possibly accounting for the congenital, certainly does not do so for all cases of the adult form. There are many cases of cystic kidney in which no papillary atresia has been found.

To account for these cases, it has been thought that the obstruction is due to the effects of a chronic interstitial nephritis, which gives rise to an abundant increase in the amount of fibrous tissue. This sclerosis, according to some, obliterates the tubules by compression and narrowing of the lumen; according to others, by contraction of the fibrous tissue

the tubules are drawn out at various points to form dilatations, which further result in cysts by the accumulation of secretion. Microscopically the increase of fibrous tissue is very obvious; moreover, the specimens I have examined seem to show changes closely resembling those found in the granular kidney, but representing a still more advanced condition of the same process.

The interstitial change is more marked, and occurs earliest in the cortex, consequently there cystic change first appears as a result of the obliteration of the lumen of the convoluted tubules by the fibrous tissue and the accumulation of the retained products of secretion behind the obstruction.

In the cortex, too, cystic change is most developed.

I have already made mention of a specimen in which the cortex was almost entirely transformed into cysts, while the medulla was found to be quite free. I consider this an intermediate condition between the granular kidney containing a few small retention cysts, and the fully developed cystic kidney, in which no renal tissue is visible to the naked eye.

The comparisons which I have drawn in the course of this paper between the granular kidney with its few cysts and the large cystic kidney form an approach to this conclusion, that the changes found in both are due to the same cause, but the one is in a considerably more advanced stage of disease than the other.

Opposed to the inflammatory theory is the fact that in some instances only one kidney is the seat of cystic changes, the other remaining normal.

As I shall mention later, it may be suggested that injury accounts for this condition.

The increase in the fibrous tissue is thought by some, including Bard and Lemoine, to be secondary to the formation of cysts, and to be due to their irritating effect. This idea is based on the observation that round the smallest cysts there is considerably less fibrous tissue than round the larger, while in the neighbourhood of the dilated tubules there is none at all. This I am not able to confirm.

2. *The Neoplastic Theory* has met with most support from Sabourin, Lejars, Courbis, Malassez, and other foreign writers. It is based on the view that under the influence of some irritation, usually inflammatory, the renal epithelium undergoes proliferation, and gives rise to the new formation of glandular alveoli—a so-called adenomatous change. This new glandular tissue possesses no secreting function; the lumen of its alveoli becomes blocked by products of proliferation, cells, and epi-

thelial debris. These products undergo degeneration and a cyst results.

Sabourin describes a granular kidney in which he found small masses of adenomatous tissue, and traced the growth of the cysts from dilatation of the alveoli of the new glandular deposits through the various stages up to the fully formed cyst. Malassez describes these collections of adenomatous tissue under the name of mucoid epithelioma. Von Kahlden supports Sabourin's view, terming the growth "adeno-cystoma." In the specimens I have examined I could discover no such condition, and should feel inclined, judging from the microscopical differences between cystic adenomatous growths of the kidney and cystic disease, to draw a strong line of distinction between the two.

In the cases of cystic adenoma I have seen, the tumour occupied only a portion of the kidney and was definitely encapsuled; the rest of the kidney tissue was healthy; microscopically well-defined alveoli of glandular tissue could be seen lined by cubical epithelium, many of them crowded with cells, while some of them could be seen encroaching on the tubules, and masses of cells invaded the interstitial tissue—a condition quite different to that met with in true cystic disease.

Bard and Lemoine object to this theory of new growth, considering that cystic disease is essentially innocent and altogether unassociated with adenomatous formation.

More recently other theories have been raised to explain the origin and suggest some error of development as a cause.

Shattock, in 1887, described a case of bilateral cystic disease of the kidneys in the new born, and attributed the condition to histological maldevelopment. He considered the spaces as retention cysts, originating in the tubules of the mesonephros or Wolffian body. To explain this theory, it is necessary first to briefly describe the development of the kidney and its connection with the Wolffian body. In the embryo both are derived from the intermediate cell mass of mesoblastic tissue situated between the dorsal plate and the mesoblast of the somatopleure.

The intermediate cell mass becomes divided into three portions:—

(1.) Anterior, forms the pronephros or head of the kidney, is very rudimentary, and disappears very early in the human embryo.

(2.) Middle, is the mesonephros or Wolffian body, from which the generative glands are formed.

(3.) Posterior, is the metanephros, which gives rise to the permanent kidney. The ureter develops from the Wolffian

duct, is developed from mesoblast, and becomes invaginated into the kidney to form the pelvis and calices. The glomeruli are developed mesoblast connected with the aorta.

Shattock considers that the congenital cystic kidney results from want of differentiation of the metanephros from the mesonephros or Wolffian body. The two become mingled, and the latter, consisting of glandular tubules, becomes converted into cysts, scattered through the proper renal tissue by the accumulation of secretion and distension of the alveoli.

Cysts in the kidney itself may also arise by secondary pressure of the development cysts on the proper renal tubules, thus leading to the formation of true retention cysts.

The excess of intertubular connective tissue Shattack believes to be a secondary lesion due to the irritative tension produced by the enlarging cysts.

Though certainly a possible explanation of the origin of the cysts, this theory seems to place the congenital cystic kidney side by side with tumours of the kidney of congenital origin, such as the striped myosarcoma, which is capable of undergoing cystic change, and the cystic adenoma, which I have already described, as presenting complete microscopical differences from the cystic kidney. However, this mode of cystic formation in the kidney may be compared with that found in the testicle and ovary, for some cysts of these organs are supposed to originate in developmental remains.

In 1890 Bard and Lemoine published an article in *Les Archives de Général Médecin* on cystic disease of glandular organs, in which they attributed the origin of the cysts in the kidney to a dilatation of the tubules, without the existence of any obstruction. They say that the dilatation is due to a congenital weakness of the hyaline membrane of the tubules, which give way to the normal pressure of the urinary secretion from defective resistance. They attribute cystic change in the liver to the same cause, but own they have no proof of this congenital weakness beyond the fact of the frequent association of the congenital cystic kidney with congenital malformation.

Still, at the beginning of this year, at a meeting of the Pathological Society, showed a specimen of congenital cystic disease of the kidney and liver in an infant aged 8 weeks, in which the cystic condition of the liver was only visible on microscopical examination. He was opposed to the inflammatory theory to account for the origin of the cysts, on the ground that there was no jaundice, the fibrosis was not progressive in the liver, and in the kidney there were no signs of inflammation, and the condition was too advanced to be the result of inflam-

mation. He attributed the cystic change to irregular development, "an overgrowth of the mesoblastic elements of the organs leading to cystic dilatation of the tubules."

In the kidneys all the elements, the glandular tubules, blood-vessels, and calices and pelvis are derived from mesoblast; while in the liver only the interstitial and blood-vessels are formed from mesoblast, the rest from hypoblast.

Other theories have been suggested to account for cystic disease of the kidney. Some have attributed it to œdema, or vacuolation of the cells of the renal tubules, and consider each cyst to originate from a single cell by gradual distension. These seem highly improbable explanations, and which I have been unable to confirm in the specimens I have examined.

Bard and Lemoine mention that Cloquet and Tillaux believe the cystic formation to be outside the glandular tissue and due to dilatation of the lymphatic vessels.

Sabourin states that Klein supposed the cysts to take origin from the glomeruli. In no specimen I examined were the glomeruli cystic.

Morgan, in his Lettsomian Lectures, drew attention to the fact that in some cases cysts of the kidney were due to the effects of inflammation in the perirenal tissue following on an injury to the abdomen.

Such may be the cause of those cases in which only one kidney is the seat of the cystic change. A possible failure of junction of the cortical and medullary tube, and consequently cystic dilatation of the former, has been suggested by Rindfleisch.

II. *The Liver.*

The number of theories propounded to account for cystic degeneration are almost as numerous in the case of the liver as in the kidney. The most important ones may be summed up under three headings:—

1. The inflammatory theory.
2. The neoplastic theory.
3. The developmental theory.

I. *The Inflammatory Theory* has been upheld by many pathologists for some years, but it has been differently applied to account for the formation of the cysts.

The older writers considered that inflammation produced a sclerosis of the organ, and that the increase in the amount of fibrous tissue was a general one, extending into the interlobular

spaces as a diffuse network. The primary growth of the connective tissue compressed and obstructed the original capillaries, and gave rise to secondary cyst formation.

Opposed to this view is the fact that in the majority of cases no dilatation of the proper bile ducts is present, and that in the contents of the cysts bile salts and pigments are quite absent.

Others have attributed the cystic formation to a primary proliferation of the original bile ducts, as the result of inflammation, followed by a secondary formation of fibrous tissue.

More recently Sabourin has described a connective tissue formation in the liver as the result of inflammation, accompanied or followed by an epithelial process.

In the course of this change he mentions the formation of entirely new bile capillaries from trabeculæ of liver tissue, situated in the middle of a connective tissue nodule. He further describes the new bile canaliculi in the fibro-epithelial nodule thus formed as undergoing an alveolar transformation, and giving to the nodules the appearance of cavernous angiomata.

In these so-called biliary angiomata some spaces develop by distension of the new alveoli, and large cysts are formed by confluence of smaller ones.

Sabourin also mentions the possibility of the cysts originating from—

1. Pre-existing bile canaliculi.
2. Remains of vasa aberrantia.
3. Mucous gland of biliary ducts.

In describing two cases, one of cirrhosis, and the other of cystic disease of the liver, he traces the growth of the cyst from the dilated bile duct, found in a condition closely resembling biliary cirrhosis, through the angiomatous stage to the fully formed space.

Judging from the few specimens of early cystic disease which I have examined, I feel inclined to believe this view, for the changes Sabourin describes are almost exactly similar to those I have seen.

Kanthack and Rolleston support this theory; they consider the condition inflammatory and allied to biliary cirrhosis, the bile ducts being the result of new formation.

Rolleston thinks that the association of occipital meningocele and cystic pancreas found in some cases is evidence in favour of the view of new formation due to inflammation.

II. *The Neoplastic Theory.*—Matassez disregards the influence of inflammation, and considers the cystic formation due to a

neoplasm, to which he gives the name mucoid epithelioma, tracing its relationship with glandular adenoma, and attributing it to an epithelial process of new growth. The contents of glandular alveoli, composed of cells and epithelial débris, undergo degeneration; by distention the alveoli give rise to the formation of cysts.

Nauwerck and Hufschmidt also consider the cysts to be due to adenomatous changes taking origin in pre-existing bile ducts. Vonkahlen supports this view, as also does Lejars.

Bard and Lemoine are strongly opposed to this view, and assert that it is altogether false, in that it gives cystic disease the character of malignancy; that glandular organs can present adenomatous cystic tumours, which must be distinguished from true cystic disease—the one, usually innocent, may become malignant, the other always remains innocent.

III. *The Developmental Theory.*—I have already referred, in discussing the kidney, to the views which were recently supported at a meeting of the Pathological Society, namely, that the cystic formation is due to maldevelopment of the mesoblastic elements. On what proofs the theory is based I am unable to say.

Bard and Lemoine, as in the kidney so in the liver, attribute the cysts to a yielding of the walls of the bile capillaries, under the influence of the normal pressure of biliary secretion. They say that the dilatation requires a special diseased predisposition of the wall of the glandular tubes, and assert that this predisposition is of congenital origin, and is due to a defect in the quality of the fundamental substance constituting the tubules. They have no evidence to show for this theory, but I think justly state that the difference in degree of the cystic change on the kidneys and liver is due to the higher blood pressure in the one compared with that in the other, and consequently to the pressure of the secretion in the kidney being greater than in the liver. For in all cases observed the kidneys present a far more marked cystic change than does the liver.

Of other theories I will briefly refer to that set on foot by Pye Smith, who states that he observed vacuolation occurring in the hepatic cells, and cysts of all sizes in the liver tissue surrounded by no definite wall. The vacuoles seen in the cells occurred single, in twos and threes, or completely riddled the protoplasm of the cell.

A similar change has been noted by Hale White in a cystic liver from a case of yellow fever.

Those who have observed this vacuolation of the cells assert that its appearance can be readily distinguished from fatty change, and from post-mortem emphysema occurring in the liver.

I have heard the opinion stated that this vacuolation is an illusion, and that it may be produced by section of a minute vessel, at various levels, capping a cell.

CONCLUSION.

In the course of the study of cystic degeneration of the kidneys and liver I have arrived at the following conclusions:—

1. There are two forms of cystic degeneration of the kidney—
(1.) Congenital. (2.) Adult or acquired. Both are the result of inflammation.

The congenital cystic kidney is due to an intrauterine process affecting in some cases the medullary portion of the kidney, and causing atresia of the papillæ, in other cases affecting both cortex and medulla. The adult cystic kidney is an acquired condition due to a chronic process originating in the cortex, and resulting in a compression and obliteration of the tubules by the overgrowth of interstitial fibrous tissue. This chronic increase of connective tissue is probably the result of an inflammatory process.

2. The adult cystic kidney and the granular kidney, containing a few small retention cysts, are due to the same cause; the former represents a more advanced stage of the same disease than the latter.

3. Cystic degeneration of the liver associated with that of the kidney is a rare condition, and among the total of my cases was present eleven times out of forty-six, including congenital forms, or less than 25 per cent. Still more rarely does cystic degeneration of the liver occur alone.

4. Cystic disease of the liver in the infant and adult are both due to the effects of inflammation, producing a condition in the early stage closely resembling biliary cirrhosis. The cysts take origin from bile ducts of new formation, possibly resulting from altered trabeculæ of hepatic cells.

5. The association of cystic disease of the liver with that of the kidney is not a coincidence; both are of inflammatory origin. The cause of the inflammation may be attributed to the influence of some toxic material circulating in the system. Evidence of this is seen in the effects on the liver and kidney of alcohol and various poisons, such as phosphorus and toxins formed in the course of certain fevers.

6. In some cases both liver and kidneys to the naked eye may present no sign of cystic change, yet microscopical examination may show them to be in the early stage of the disease.

SUMMARY OF CASES.

I.—CYSTIC DEGENERATION OF ONE OR BOTH KIDNEYS.

Cases from St. Bartholomew's Hospital.

Age.	Sex.	History and Duration of Symptoms before Death.	Kidneys, &c.	Heart and Vessels.	Death.
M. A. 53.	F.	Alcohol 15 years; admitted with cellulitis of arm and died in three days. Urine, acid; sp. gr. 1026; trace of albumin.	Left cystic. Right granular. No cysts.	Hypertrophy of L. V.	Cellulitis of arm.
A. C. 59.	F.	Abdominal swelling five weeks; flanks dull to percussion; great pain five days before death. Urine, daily amount 20-75 oz.; acid; sp. gr. 1015; trace of albumin.	Both cystic. Cyst in left ovary.	Normal.	Died in great pain.
W. S. 47.	M.	Pain in abdomen eight months; hæmaturia one week; epistaxis three days. Urine, acid, pale; sp. gr. 1010; amount scanty; albumin two-thirds. Died comatose.	Both very cystic. Left 22 oz. Right 20 oz.	Great hypertrophy of L. V. Atheroma of aorta & cerebral vessels. Brain, old hæmorrhage.	Uræmia.
H. S. 32.	F.	Abdominal swelling three months. Urine, acid; sp. gr. 1020; pus and albumin cloud.	Right cystic. Left normal.	...	Died two days after nephrectomy of right kidney.
J. P. 22.	M.	Attacks of colic and vomiting three months; abdomen distended and tympanitic. Urine, acid; amount, 40-120 oz.; much albumin. Nephrectomy of right kidney.	Right composed of many small cysts.	...	Recovery.
J. L. 53.	M.	Much alcohol; injury to abdomen twelve weeks before, then vomiting and great constipation; tumour in right side of abdomen for six weeks. Urine, acid; sp. gr. 1015; trace of albumin.	Both cystic. Right 22 oz. Left 20 oz.	Hypertrophy of L. V.	Died in great pain, and with persistent vomiting.

I.—CYSTIC DEGENERATION OF ONE OR BOTH KIDNEYS—(continued).

Cases from St. Bartholomew's Hospital.

Age.	Sex.	History and Duration of Symptoms before Death.	Kidneys, &c.	Heart and Vessels.	Death.
J. A. 49.	M.	Treated for stricture 3½ years; colic, albuminuria, and pyuria seven months; pain in left lumbar region; cachexia one month; hæmaturia and great pain in loins two weeks. On admission, tumour in right flank, resistance in left. Epistaxis three days before death. Urine, acid; sp. gr. 1010; scanty, 5 oz.; much pus; albumin, ¼. Urea, 1.2 per cent. Died comatose.	Both very cystic. Left 26 oz. Right 24 oz. Ureters normal. Bladder slight hypertrophy. No urethral obstruction.	Marked hypertrophy of L. V. Some atheroma of vessels.	Uræmia.
W. W.	M.	Injury ten weeks; pain and tumour in left hypochondrium four weeks. Urine, acid; sp. gr. 1010; trace of albumin later; blood.	Right cystic. Left huge cyst, pushing up left lobe of liver.	Weight 10 oz.	Died one week after operation. Puncture and drainage of cysts.
E. T. 58.	F.	Pain twenty months; tumour three months; persistent vomiting after admission; general anasarca. Urine, acid; trace of albumin.	Both cystic.	Thickening of valves. Aorta very atheromatous.	Persistent vomiting.
E. H. 27.	F.	Married, two children, last three years before. Attacks of hæmaturia eighteen months; later very severe pains in loins; anæmia. Urine very offensive; copious; much blood.	Left normal. Right a mass of cysts. Ureters filled with blood. Not dilated.	Normal.	Death from exhaustion.
J. G. 63.	M.	No history. Fell down suddenly in the street.	Both much enlarged and very cystic.	Hypertrophy of L. V.	Sudden.
R. C. 65.	M.	History of alcohol.	Large cysts over surface of both kidneys. Some cortex left apparently healthy.	Hypertrophy of L. V.	Due to cirrhosis of liver.

I.—CYSTIC DEGENERATION OF ONE OR BOTH KIDNEYS—(*continued*).*Cases from St. Bartholomew's Hospital.*

Age.	Sex.	History and Duration of Symptoms before Death.	Kidneys, &c.	Heart and Vessels.	Death.
E. K. 19.	M.	Sudden loss of consciousness; admitted to hospital comatose. Urine, sp. gr. 1016; trace of albumin.	Left 9 oz. Cortex riddled with cysts. Medulla, some normal tissue. Right 7 oz. Cortex diminished. Very few small cysts.	Slight hypertrophy of L. V. Vessels, aneurysm of left middle cerebral; rupture beneath arachnoid and dura mater.	In four days. Comatose. Cerebral hæmorrhage.
S. J. 40.	F.	Right hemiplegia three years previously; two attacks of cerebral hæmorrhage five days and immediately before admission.	Each weighed 19½ oz. A mass of small cysts.	Cerebral vessels. Old and recent hæmorrhage into left side of brain.	Comatose. Cerebral hæmorrhage.
G. V. 54.	M.	Old hemiplegia.	Both cystic.	Hypertrophy of L. V. Brain, old and recent hæmorrhages.	Cerebral hæmorrhage.

Cases Reported in St. George's Hospital Museum.

45.	M.	Cramps and vomiting six months; cachexia. Urine, large amount; sp. gr. low; much albumin and pus; casts.	Both cystic, and weighed 40 oz.	Hypertrophy of L. V.	Epileptiform convulsions. Uræmia.
48.	M.	Bronchitis one month; dyspnœa five days. Urine, pale; much albumin.	Both cystic. Weighed 81 oz.	...	Bronchitis.
48.	M.	Ingravescent coma; left hemiplegia.	Left cystic. Right normal, but enlarged.	Hypertrophy of L. V. Atheroma of cerebral vessels.	In thirty-six hours. Comatose. Cerebral hæmorrhage.

Case from St. Thomas's Hospital Museum.

51.	M.	...	Both cystic.
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I.—CYSTIC DEGENERATION OF ONE OR BOTH KIDNEYS—(continued).

Cases from "Pathological Society's Transactions," described by
Pye Smith, vol. xlvi.

Age.	Sex.	History and Duration of Symptoms before Death.	Kidneys, &c.	Heart and Vessels.	Death.
F. S. 27.	M.	Vomiting and diarrhoea fourteen days; coma four days; albuminuric retinitis. Urine, albumin, casts; trace	Right 41 oz. Left 51 oz. Both cystic.	Hypertrophy of L. V. Atheroma of aorta.	Uræmic coma.

Pye Smith, vol. xxxvi.

27.	M.	Headache; vomiting three months; giddiness; double optic neuritis.	Both cystic. Pancreas, cystic. Cerebellum, cyst.	...	Died with symptoms of cerebellar tumour.
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Cases from "Pathological Society's Transactions," described by
Conway Evans, vol. v. p. 183.

H. 41.	M.	Dyspnoea three months; œdema of legs. Urine, acid; no albumin during a period of two months before death.	Left 5 oz. Cystic. Right 5½ oz. Healthy to naked eye, but cystic on microscopic examination.	Hypertrophy of L. V.	...
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Vol. xxxviii. p. 155.

58.	F.	Symptoms of granular kidney. Urine, copious, low; sp. gr. trace of albumin.	Left 132 oz. Right 71 oz. Both very cystic.	Hypertrophy of L. V.	Thrombosis of left femoral vein. Three days.
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Vol. xlv. p. 134.

68.	F.	Few attacks of coma.	Both cystic.	Hypertrophy of L. V. Atheroma of aorta and valves.	Uræmic coma.
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I.—CYSTIC DEGENERATION OF ONE OR BOTH KIDNEYs—(continued)

Cases from Royal College of Surgeons' Museum.

Age.	Sex.	History and Duration of Symptoms before Death.	Kidneys, &c.	Heart and Vessels.	Death.
29.	M.	Dyspnoea, faintness, and vomiting five days.	Both cystic.	...	...
67.	M.	Nil.	Both cystic.	Atheroma of vessels.	Cerebral hæmorrhage.
...	M.	Pain in loins; five years later headache; numbness. Urine, blood and pus.	Both cystic.	...	...
50.	M.	...	Both cystic.	...	...

Cases at St. Bartholomew's Hospital, diagnosed as Cystic Disease of Kidneys, not verified by Post-mortem Examination.

Age.	Sex.	History Previous to Admission.	Subsequent History.
A. W. 36.	F.	Hæmaturia six years; tumour right side three years; pain and vomiting; tumour left side four months. Urine, acid; sp. gr. 1015; trace of albumin; amount normal.	Discharged after one month; relieved by wearing belt.
A. E. 47.	F.	Pain fifteen months; tumour left side; twelve months anuria; repeated attacks. Urine, amount 12-20 oz., 40-50 oz.; variable; sp. gr. 1025; trace of albumin; urea 1.2-1 per cent. Physical examination, large bossed swelling occupying left half of abdomen.	Operation, left kidney found to be cystic; some cysts opened and obtained; 2 oz. of urinous fluid escaped. Urine very scanty, 3-20 oz. per diem; blood since operation. Pain continuous and severe in loins.
F. S. 47.	M.	Pain in loins two months; abdominal bilateral tumour found on admission. Urine, amount 40 oz.; sp. gr. 1018; trace of albumin; urea 1.4 per cent.	Jan. 1897-Feb. 1898, general health much improved by change of air. Pain continuous, more severe; tumour on right side increased, that on left stationary. Urine, no blood or pus.

II.—CYSTIC DEGENERATION OF KIDNEYS AND LIVER.

Case shown by Raymond Johnson at Pathological Society. Report in
 "Lancet," January 8, 1898.

Age.	Sex.	History and Duration of Symptoms before Death.	Kidney.	Liver.	Heart and Vessels.	Death.
53.	...	Hæmaturia twelve and four years; vomiting and tumour five months. Urine, amount 25-30 oz.; sp. gr. 1010; trace of albumin; urea 7 per cent. No jaundice.	Left 62½ oz. Right 24 oz. Both cystic.	Cystic.	...	Sudden.

Case Reported by Frierich's in "Diseases of Liver." Translated by Murchison, p. 223.

Old.	Left many cysts in cortex. Right no cysts.	Cystic.
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Case from College of Surgeons' Museum (Eve, 1889).

46.	...	Enlargement of liver four years; left kidney enlarged to brim of pelvis. No jaundice.	Both cystic.	Cystic.
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Case Reported by Courbis, Thèse de Paris, 1877.

J. V. 62.	...	Ascites twenty years; tumour in epigastrium and right side four years; increased in size twelve months; no jaundice. Physical examination, tumour, bossed, uneven; fluctuating nodes. Urine normal.	Both cystic.	Weight 8 kilogrammes Very cystic.
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II.—CYSTIC DEGENERATION OF KIDNEYS AND LIVER—(continued).

Cases from "Pathological Society's Transactions," described by Pye Smith,
vol. xxxii. p. 112.

Age.	Sex.	History and Duration of Symptoms before Death.	Kidney.	Liver.	Heart and Vessels.	Death.
53.	M.	Much alcohol. Chronic lung disease; no jaundice; pulse increased tension. Urine abundant; trace of albumin; sp.gr. 1015.	Both cystic. Weight 6½ oz.	Cystic, puckered, and of normal size.	...	Chronic interstitial pneumonia.
<i>Hebb, vol. xxxv.</i>						
E. A. 24.	F.	Persistent vomiting; pregnant eight months; died comatose. Urine solid with albumin.	Both cystic.	Cystic.	...	Uræmic coma.
<i>Bristowe, vol. vii. p. 257.</i>						
53.	M.	Pain in epigastrium and right side ten weeks. Hæmaturia.	Both cystic.	Cystic. Weight 4 lb.	Hypertrophy of L. V.	...
<i>Bristowe, vol. x. p. 174.</i>						
...	F.	Married. Cough; no renal symptoms.	Both cystic. Weight 17¾ oz.	Cystic.	...	...

III.—CONGENITAL CYSTIC DEGENERATION OF KIDNEYS AND LIVER.

Cases from St. Thomas's Hospital Museum.

Age, Sex.	History.	Kidneys.	Liver.	Death.
Fœtus.	Obstructed labour.	Cystic.	?	Still born.
Fœtus.	Anencephalic.	Cystic.	?	Still born.
Fœtus.	Seven months.	Cystic.	?	Still born.

*Cases from "Pathological Society's Transactions," described by Shattock,
vol. xxxvii. p. 287.*

Fœtus.	Full term.	Cystic.	?	Still born.
Fœtus.	Ascites; six fingers; webbed toes, occipital meningocele.	Cystic.	Cystic only on micro- scopical examination.	Still born.
Child, four weeks.	General œdema. Urine solid with albumin.	Cystic.	Cystic only on micro- scopical examination.	Uræmia.

*Case reported by G. F. Still to Pathological Society, described in
"Lancet," January 1, 1898.*

Child, eight weeks.	Renal tumour; wasting; no jaundice. Urine very albuminous.	Cystic.	Cystic only on micro- scopical examination.	Uræmia.
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*Case described by Pye Smith, mentioned by Kanthack and Rolleston,
"Virchow's Archives," Bd. 130, 1892.*

Child, ten months.	œdema; ascites. Urine loaded with albumin.	Cystic.	Cystic visible.	Uræmia.
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IV.—CYSTIC DEGENERATION OF LIVER ONLY.

*Cases reported in "Pathological Society's Transactions" by
Savage and Hale White, vol. xxxv. p. 214.*

Age.	Sex.	History.	Kidneys.	Liver and other Viscera.	Death.
42.	F.	Acute mania.	Riddled with cysts.	Heart 6½ oz.	In twenty-four hours.
...	M.	Yellow fever (jaundice).	Many cysts.	Aorta atheroma- tous.	Acute mania.
...	F.	...	Surface granular; many small cysts.	...	...

V.—SIMPLE CYSTS OF LIVER.

Age.	Sex.	History.	Kidneys.	Liver.	Death.
39.	M.	...	Simple globular cyst.	...	...
M. B. 38.	F.	Fracture of skull.	Large single cyst; diameter, 6 ins.	Right ovary cyst; left ovary small cysts. Kidneys granular.	Hæmorrhage after fracture of skull.
J. V. 11 months.	M.	...	Single cyst.	Normal.	...

I have consulted the following works and papers on the subject of cystic degeneration of the kidneys and liver:—

1. COURBIS. "Contribution à l'étude des kystes du foie et des reins," 1877. Thèse de Paris.
2. SABOURIN (1). "Contribution à l'étude de la degenerescence kystique des reins et du foie." *Arch. de Physiologie*, 1882.
— (2). "À propos de deux kystes du foie d'origine billaire." *Le Progrès Médical*, May 1884.
3. LEJARS. "Du gros rein polykystique de l'adulte." Thèse de Paris, 1888.
4. BARD ET LEMOINE. "De la maladie kystique essentielle des organes glandulaires." *Arch. de Général Médecin*, 1890.
5. KANTHACK AND ROLLESTON. "Congenital Cystic Disease of the Kidneys and Liver." *Virchow's Archives*, 1892, Bd. 130, p. 488.
6. PATHOLOGICAL SOCIETY'S TRANSACTIONS—
Conway Evans, vol. v. p. 183.
Bristowe, vol. vii. p. 251; vol. x. p. 174.
Pye Smith, vols. xxxii. p. 112; xxxvi. p. 7; xlvi. p. 81.
Sharkey, vol. xxxiii. p. 168.
Savage, Hale White, Hebb, vol. xxxv. pp. 214, 217, 221.
Shattock, vol. xxxvii. p. 287.
Pitt, vol. xxxviii. p. 164.
Edmonds, vol. xliii. p. 89.
Beadles, vol. xlv. p. 124.
7. KANTHACK. "Notes on Recent Works by German Authors."
8. WARING. "Diseases of the Liver," pp. 148-155.
9. BARCLAY SMITH. "Notes on Morphological Anatomy" (development of kidney).

PROCEEDINGS
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<i>Presidents</i>	}	Mr. J. W. STEPHENS.
		Mr. W. R. STOWE (resigned October 3).
		Mr. S. GILLIES (elected October 22).
<i>Vice-Presidents</i>		Mr. R. H. BREMRIDGE and Mr. J. HUSSEY.
<i>Hon. Secretaries</i>		Mr. W. LANGDON BROWN and Mr. H. L. ORMEROD.
<i>Additional Committee-men</i>		Mr. A. COMPTON and Mr. J. S. WILLIAMSON.

July 9, 1896.

The Midsummer Meeting was held, Mr. J. W. Stephens, President, in the chair.

Dr. Gee delivered his address on 'The Conflict of Medicine with the Smallpox.' The meeting terminated with a vote of thanks to Dr. Gee, proposed by Mr. D'Arcy Power, and seconded by Mr. Stack.

October 8.

The Introductory Address was delivered by Mr. Howard Marsh, and was entitled, 'The Abernethian Society in Relation to the Hospital and School.'

A vote of thanks was proposed by Mr. Meakin, and seconded by Mr. Mitchell.

Mr. J. W. Stephens, President, occupied the chair.

October 15.

An ordinary meeting, Mr. Hussey, Vice-President, in the chair.

Mr. M. Langdon Brown read a paper on 'The Extinction of the Plague in England.'

A brief discussion followed.

October 22.

A clinical evening, Mr. Gillies, President, in the chair.

Mr. L. B. Burnett read a paper on 'Ulcerative Colitis.'

A short discussion followed.

Mr. J. P. Maxwell then showed an interesting series of photographs illustrating some Tropical diseases.

Mr. E. Toye showed the original case of 'Myositis ossificans,' described by Virchow.

Mr. Strangeways Pigg exhibited a series of sections containing diphtheria bacilli.

Mr. J. P. Maxwell described a case of 'Suppurative cholangitis' ending fatally. A microscopic section was shown of the bile duct.

Other microscopic specimens were exhibited.

October 29.

An ordinary meeting, Mr. Hussey, President, in the chair.

Dr. Morrison read a paper on 'The Treatment of the Puerperal Uterus.'

A brisk discussion followed.

November 5.

An ordinary meeting, Mr. Stephens, President, in the chair.

Mr. Collings read a paper on 'Diphtheria.'

A discussion followed.

November 12.

An ordinary meeting, Mr. Gillies, President, in the chair.

Mr. A. Doran read a paper on 'The Details of Ovariectomy and Disputed Points in the After-Treatment.'

A discussion followed.

November 19.

A clinical meeting, Mr. Stephens, President, in the chair.

Dr. Kanthack read a communication on the 'Tse-tse Fly.'

Messrs. Worthington, May, Maxwell, Strangeways Pigg, and Stephens made other communications.

November 26.

An ordinary meeting, Mr. W. L. Brown in the chair.
Dr. Habershon read a paper entitled 'Accurate Diagnosis from Physical Signs.'
A discussion followed.

December 3.

An ordinary meeting, Mr. Gillies, President, in the chair.
Dr. Cantley read a paper on 'The Value of Foods in Infantile Diarrhoea.'
A short discussion followed.

December 10.

An ordinary meeting, Mr. Stephens, President, in the chair.
Mr. Hewer read a paper on 'Indications for Trephining.'
A discussion followed.

January 14, 1897.

The Mid-Sessional Address was delivered by Dr. E. G. Browne, entitled 'A Chapter in the History of Cannabis Indica.'
A vote of thanks was carried with enthusiasm.
Mr. Gillies, President, occupied the chair.

January 21.

An ordinary meeting, Mr. Stephens, President, in the chair.
Mr. Spicer read a paper entitled 'Eye Symptoms in General Diseases.'

January 28.

An ordinary meeting, Mr. Gillies, President, in the chair.
Dr. Claye Shaw read a paper on 'Wounds and Bruises in the Insane.'

February 4.

An ordinary meeting, Mr. Hussey, Vice-President, in the chair.
Mr. R. H. Bremridge read a paper on 'Affections of the Vaso-motor System.'
A brief discussion followed.

February 11.

An ordinary meeting, Mr. Gillies, President, in the chair.
Mr. Horder read a paper on 'Glycosuria.'
A short discussion followed.

February 18.

An ordinary meeting, Mr. Stephens, President, in the chair.
Dr. F. W. Andrewes read a paper on 'Vaccination and its Results.'

February 25.

A clinical evening, Mr. Gillies, President, in the chair.
Dr. Crowley showed a case of gouty parotitis.
Mr. W. L. Brown showed a case of hereditary ataxia in a boy *æt.* 6 $\frac{3}{4}$ years.
Mr. Parfitt demonstrated the method employed in the Hospital for the serum diagnosis of typhoid fever.
Mr. Rowland stated the precautions necessary in the diagnosis of intra-thoracic conditions by aid of the Röntgen rays.
Messrs. Stack, J. Maxwell, Strangeways Pigg, and J. L. Maxwell gave other communications.

March 4.

An ordinary meeting, Mr. Stephens, President, in the chair.
Dr. Crowley read a paper on 'Two Hundred Cases of Adenoids.'

March 11.

An ordinary meeting, Mr. Gillies, President, in the chair.
Mr. Murphy read a paper on 'Antiseptics in Midwifery.'
A discussion followed.

March 18.

The General Meeting, Mr. Gillies, President, in the chair.
The report of the outgoing Committee and the balance-sheet were read and adopted.
The names of the officers elected for the ensuing year were declared as follows:—

Presidents—Messrs. W. L. Brown and J. Hussey.

Vice-Presidents—Messrs. T. J. Horder and A. L. Ormerod.

Hon. Secretaries—Messrs. E. S. Hewer and H. Thursfield.

Additional Committee-men—Messrs. E. Talbot and J. S. Williamson.

DESCRIPTIVE LIST

OF

SPECIMENS REVISED AND ADDED
TO THE MUSEUM

DURING THE YEAR 1897.

SPECIMENS REVISED AND ADDED TO THE MUSEUM

During the Year ending September 30, 1897.

DESCRIBED BY

A. A. KANTHACK AND T. S. PIGG.

INTRODUCTORY REMARKS.

DURING the last year formalin has been extensively used in the preparation of Museum specimens, and there can be no longer any doubt that specimens preserved in formalin and subsequently mounted in glycerine are truer to nature than blanched spirit specimens. Formalin is especially useful where blood-colour has to be fixed, and should be used with discrimination. The methods most commonly employed were those of Jores and Kaiserling, with slight modifications. A short account of these methods is given below. The specimens added last year, and prepared by one or other formalin method, have not lost anything in colour, and are quite as good as they were the day they were put up. Amongst this year's formalin specimens the most striking are :—

No. 380 <i>b</i>	Exostosis.	No. 2203 <i>b</i>	Nutmeg Liver.
„ 1233 <i>d</i>	Subpericardial Hæmorrhages.	„ 2301 <i>b</i>	Tubercle of Spleen.
„ 1678 <i>b</i>	Subpleural Growths.	„ 2331 <i>e2</i>	Renal Infarct.
„ 1696 <i>a1</i>	Broncho-pneumonia.	„ 2334 <i>b</i>	Contracting White Kidney.
„ 1702 <i>a</i>	Œdema of Lung.	„ 2341 <i>h</i>	Tubercular Kidney.
„ 1728 <i>f</i>	Sarcoma of Lung.	„ 2381 <i>c</i>	Cystic Kidney.
„ 1885 <i>e</i>	Omental Cysts.	„ 2418 <i>b</i>	Papilloma of Bladder.
„ 1935 <i>b</i>	Carcinoma of Stomach.	„ 2904 <i>b</i>	Multilocular Ovarian Cyst.

Again an attempt has been made to supply a microscopic section with every specimen added, but the revision and re-numbering of the older histological specimens in the Museum had to be deferred, nor has a Student's Cabinet been provided yet. As far as the revision of specimens

is concerned, less has been done this year. Six specimens have been revised, viz. :—

No. of Specimen.	Diagnosis in Catalogue.	Diagnosis on Re-examination.
2797 ^m	Sarcoma	Carcinoma (columnar celled).
2797 ⁿ		
2797 ^o		
2784	Chondroma	Carcinoma (columnar celled).
2785		
2786		

Of these, the re-examination of the Malignant Enchondroma was of particular interest, since the series of specimens had been prepared by Sir James Paget, who described the case in 1857 as a cartilaginous tumour, and as such it had been more or less generally accepted. There is, however, no doubt as to its carcinomatous nature.

No specimens have been rejected this year, because the time and leisure necessary for thorough revision could not be found, but an Alphabetical Index has been prepared of the Casts and Models in the Museum. It is evident from this index that they are sadly in want of re-arrangement.

The following is a Table of the specimens added, re-numbered, or re-mounted, of casts, photographs, drawings, and microscopic specimens added :—

Old specimens re-mounted	70
Old specimens re-numbered	21
New specimens added	177
Casts added	9
Photographs added	26
Drawings added	15
Microscopic sections added	75

FORMALIN METHODS FOR THE PRESERVATION OF MUSEUM SPECIMENS.

It may be useful in this introduction to give a brief account of the various methods used in the preservation of specimens with formalin.

METHOD I.—JORES'S METHOD (*slightly modified*).

A. If the original cut surface is to be preserved,

(1.) The specimen is first rinsed in cold tap water and cleansed on its surface, and then placed in the following solution :—

Formalin	6 parts
Tap water	100 „
Sodium chloride	1 „
Sodium sulphate	2 „
Magnesium sulphate	2 „

- (2.) The specimen remains in this solution for forty-eight hours, and is then transferred to pure strong spirit for ten minutes; and then
- (3.) Transferred to fresh spirit. Here the specimen must be carefully watched. Soon the colour, which had disappeared to a great extent in the formalin solution, slowly and gradually comes back, but after about half an hour to an hour it begins to fade.
- (4.) Immediately it begins to fade the specimen must be placed in a mixture of glycerine, water, and potassium acetate.

Water	1000 cc.	}	If this solution is turbid or milky, it must be filtered before use.
Potassium acetate	30-50 grms.		
Glycerine	1000 cc.		

In this glycerine mixture the colour becomes intensified, and regains much of its natural appearance.

- (5.) Finally, it must be mounted in the same glycerine mixture.
- B. (1.) If it is not necessary to preserve the original cut surface or the natural surface of the specimen, as the case may be, then the specimen, after having been carefully suspended in the formalin solution for about forty-eight to seventy-two hours, according to its thickness and consistence, should be placed in spirit for one to five hours. It is impossible to state the exact time for all cases, for this depends greatly on the firmness, size, and nature of the organ.
- (2.) At the end of this time a fresh surface is obtained by removing a *thin* slice with a long and sharp knife. The specimen with its renewed surface is then put back into the formalin solution for another twelve to twenty-four hours, and then passed through the two changes of spirit as described above, and treated with the glycerine solution in the same manner.

Jores's method gives extremely good results with kidneys (especially large white), brains, and malignant disease of the liver.

METHOD II.—KAISERLING'S ORIGINAL METHOD (*slightly modified*).

This method is best for organs containing much blood, such as nutmeg liver, hæmorrhages, and also for very soft tumours.

- A. (1.) If the original cut surface is to be preserved, the specimen must be placed in the following solution:—

Formalin	750 cc.
Water	1000 cc.
Potassium nitrate	10 grms.
Potassium acetate	30 grms.

Small pieces remain in this solution for twenty-four hours, big pieces or hard tissues much longer, up to five days, but never more than five days.

- (2.) The specimen is then transferred to 80 per cent. spirit for sixteen hours, till the original colour is more or less restored.
- (3.) It is then placed in pure strong spirit for two hours, and finally placed in the glycerine solution described above.
- B. (1.) If it is not necessary to preserve the original cut surface, then the specimens, according to size and consistence, are placed in the formalin solution for twelve to twenty-four, or four times twenty-four hours.
- (2.) Then a *thin* slice is cut off, and the specimen put back into the formalin solution for twelve to twenty-four hours.
- (3.) At the end of that time it must be passed through the two changes of spirit as described above, and treated with glycerine in the same manner.

METHOD III.—KAISERLING'S NEW METHOD.

This method, which, according to Kaiserling, gives better results even than the two previous methods, is a compromise between Jores's and Kaiserling's original method.

- (1.) The specimen is fixed in the following solution:—

Formalin	200 cc.
Water	1000 cc.
Potassium nitrate	15 grms.
Potassium acetate	30 grms.

In this solution it remains at least twenty-four hours, and longer if the specimen be large, hard, and tough, but, as before mentioned, never more than five times twenty-four hours.¹

- (2.) The specimen is then placed in 80 per cent. spirit, until the colour returns—*i.e.* for two to sixteen hours; and
- (3.) Finally, it is placed in the following glycerine solution, in which it is also mounted:—

Water	2000 cc.
Potassium acetate	200 grms.
Glycerine	400 grms.

This method may prove to be the best of the three, and therefore it may be useful to copy a few directions from Kaiserling's last paper for future guidance. These may be given in tabular form:—

¹ If the specimen is voluminous and still uncut, it is often advisable to inject it with formalin solution, both through the main arteries and main veins, which of course must then be tied. The formalin solution to be used for injection must be made up as follows—

Formalin	400 cc.
Water	1000 cc.
Potassium nitrate	30 grms.
Potassium acetate	50 grms.

TABLE PREPARED FROM KAISERLING'S PAPER IN "VIRCHOW'S ARCHIV,"
vol. 147, No. 3.

	Formalin Solution.	80 per cent. Spirit.	Remarks.
Heart . .	(1) Small heart, 24 hours (2) Large heart, 3 days	4 hrs.	Easily fixed.
Aorta and vessels .	(1) Not hæmorrhagic, 12 hrs. (2) Hæmorrhagic, 24 hrs.	2-3 hrs.	
Lungs . .	(1) Uncut: inject bronchi, arteries, and veins, 4 days (2) Cut: 2-4 days, according to density	... 5-6 hrs.	Very difficult. Gives beautiful results.
Larynx . .	3 days	6 hrs.	
Spleen . .	(1) Cut: 24 hours-3 days (2) Uncut: inject every 6 hours, and keep in solution 4-5 days	4-12 hrs. 4-12 hrs.	Easily fixed.
Kidneys . .	(1) Uncut: inject and fix for 4-5 days (2) Cut: 3 days	6-10 hrs. 8-12 hrs.	Easily fixed. If cysts are present, fix the kidney <i>in toto</i> , pass through spirit, and place in glycerine for 24 hours. Then fill cysts with glycerine solution by injecting either into the ureter or through the renal parenchyma.
Liver . .	(1) Uncut: inject repeatedly through the hepatic artery, portal vein, and bile ducts (2) Cut: 3-5 days according to size	8-12 hrs.	Easily fixed. So far all attempts to fix yellow bile colour have been unsuccessful.
Gut . .	(1) Uncut: fill with formalin (2) Cut open: 24 hours if not hæmorrhagic 48 hours if hæmorrhagic	2-4 hrs. 8 hrs.	
Brain . .	Cut: 3-5 days Uncut: 8 days	6-12 hrs. 8 hrs.	Difficult.
Muscle . .	3 days	5 hrs.	
Bone . .	Always unsawn; 4-5 days	12 hrs.	Saw only after it has been in glycerine for 14 days, then place again in alcohol, and mount.

A few more points require mention :—

- (1.) A renewal of the surface by a fresh section must never be made, according to Kaiserling's latest instructions, until the specimen has been in glycerine for at least fourteen days, and it must then again be placed in alcohol for two to three hours, to freshen up the colour.
- (2.) The formalin solution can be used repeatedly, and therefore one must not be sparing with it. After it has been used twice for big specimens, add about one-fifth of the chemical ingredients, and then it may be used again twice.
- (3.) Old solution may always be used for the initial fixation, so that a specimen which requires twelve hours' hardening may be placed in an old solution for six hours and into a fresh solution for further six hours.
- (4.) If the glycerine solution is turbid, it must be filtered through cotton-wool.
- (5.) If pigments pass into the glycerine solution, the specimen must be taken out, and the solution filtered through thick layers of cotton-wool and charcoal. The pigments have generally come from the substance, and not from the surface of the specimen.
- (6.) It appears that formaldehydum solutum is better than the less pure formalin.
- (7.) To save the hands, indiarubber gloves should be worn.

With these directions, care, and common sense, extremely beautiful results can be obtained.

LITERATURE :—Joes, *Centralblatt für allg. Pathol. u. pathol. Anat.*, 1896, No. 4; Kaiserling, *Berliner klin. Wochenschr.*, 1896, August 31; Kanchack and Shaw, *Transactions of the Pathological Society, London*, vol. xlviii.; Kaiserling, *Virchow's Archiv*, vol. 147, Heft 3.

The following is the list of the Donors of specimens whose names appear in this year's Catalogue :—

H. T. Butlin, Esq.	A. E. Druitt, Esq.	H. Marsh, Esq.
R. C. Bailey, Esq.	H. Ellis, Esq.	S. Paget, Esq.
J. Berry, Esq.	J. H. Gilbertson, Esq.	Dr. C. H. Roberts.
Dr. F. H. Champneys.	W. J. C. Keats, Esq.	M. L. Trechmann, Esq.
H. Cripps, Esq.	C. B. Lockwood, Esq.	F. H. Westmacott, Esq.

I.

CORRIGENDA.

CHONDRO-CARCINOMA OF TESTIS.

2784. Section of a Mass occupying the place of a Testis, from a man æt. 37 years. The lower portion is composed of tortuous, cylindrical pieces of cartilage, which are closely packed and embedded in a tough white connective tissue. Over parts of the outer surface of the mass a layer of seminal tubules is spread out between it and the tunica albuginea. Surmounting this, and separated from it by a layer of connective tissue, is a conical mass formed of similar but smaller pieces of cartilage. This specimen had been described by Sir James Paget in 1855 as a malignant enchondroma, but re-examination in 1897 proved it to be a chondro-carcinoma.

See Specimens Nos. 2785-2787, and xi. 1744a.

For microscopic sections see *Histological Records*, xxxvi. 2784.

See *Medico-Chirurgical Transactions*, London, 1855, vol. xxxviii. pp. 247-259; *Transactions of the Pathological Society*, London, 1897, vol. xlviii. p. 149; and *Journal of Pathology and Bacteriology*, 1897, vol. v.

2785. A Branching Cartilaginous Growth which projected into the cavity of the vena cava inferior, obtained from the same case as the previous specimen. The malignant growth occupies the spermatic veins, and had extended along them from the testis into the vena cava. Histological examination of the spermatic veins proved that they were filled with typical columnar-celled cancerous deposits, and cartilage also was found amongst the vessels. The growth in the vena cava histologically was also found to be carcinomatous.

See *Histological Records*, xxxvi. 2785.

For references see the previous specimen.

2786. A Large Vein laid open. Its canal appeared filled by a large cylindrical growth, but this could be unravelled and loosened into the bundles of variously shaped small bodies suspended on long branching stems, and consisting usually of nodules of cartilage embedded in a softer tissue. This specimen belongs to the same case as Nos. 2784, 2785, 2787, and 1744a. Histologically the growth is a chondro-carcinoma.

See *Histological Records*, xxxvii. 2786.

For references see No. 2784.

2787. A Cluster of Small Oval and Rounded Tumours, which extended along the course of the spermatic cord, and were loosely connected with its structures. They are composed chiefly of small cylindrical and nodular pieces of cartilage, clustered with growths of a softer substance on slender threads, and enclosed in thin-walled canals. This specimen belongs to the same case as Specimens 2784-2786, and 1744a. The tumour histologically proved to be carcinomatous (chondro-carcinoma).

For references see No. 2784.

The preceding specimens, together with Specimen 1744a in Series xi., are from a case described by Sir James Paget in 1855, who believed it to be a malignant chondroma; but there can be no doubt that it is a carcinomatous growth, cystic and cartilaginous in parts; that it had found its way into the vena cava by means of the pampiniform plexus, and had thence passed through the right ventricle into the pulmonary circulation and the lungs.

CARCINOMA OF TESTIS.

2797m. Section through the Right Testis, removed after death from a man æt. 24 years, which is occupied by a cystic malignant growth, which microscopically proved to be a cystic columnar-celled carcinoma. There were secondary deposits in the lumbar, supra-clavicular and cervical, mediastinal, and bronchial glands, in the lungs, in the cavity of the right auricle, and in the liver, which was studded with them. The growth had also invaded the inferior vena cava and the right ureter from the infected lumbar glands, causing an obstruction both in the vena cava and in the right ureter. The man died with symptoms of suppression of urine.

Specimens of the intravenous and intracardiac growths will be found under the two following numbers.

For microscopic specimen see *Histological Records*, xxxvi. 2797m.

See *Surgical Post-Mortem Register*, (1894), p. 88; *Male Surgical Register*, vol. i. (1894), No. 1359; and *Transactions of the Pathological Society*, London, 1897, vol. xlviii.

2797n. This specimen was obtained from the same man as the preceding specimen. The preparation shows a portion of the aorta abdominalis surrounded as far as and beyond its bifurcation by infected lymphatic glands, which on section are riddled with numerous small cysts, and microscopically present the same appearances as the primary testicular growth. The inferior vena cava is shown on the left, and has been laid open. It will be seen that its lumen is considerably encroached upon by the infected glands, and further, that it is in part obstructed by a mass extending into it from the glandular growth. This mass, which at first sight resembles a clot, microscopically proved to be carcinomatous, and there can be no doubt that the curious growths which were found in the right cavities of the heart and at the cardiac end of the inferior vena cava owe their origin to this mass, which had invaded the abdominal vena cava. The growth has extended from the vena cava into the right renal vein, and thence into the right ureter, which is completely blocked.

For microscopic specimen see *Histological Records*, xxxvi. 2797n.

27970. This curiously branched mass was found in the right auricle and in the inferior vena cava of the man from whom the two preceding specimens were obtained. It was fixed to the free border of the tricuspid valve, and extended thence partly into the right ventricle and partly into the inferior vena cava. The curiously shaped lateral branches contain small cysts, filled by a small amount of clear fluid. Microscopically the growth is a cystic columnar-celled carcinoma, almost identical in its structure with the primary testicular growth 27971, but much firmer and more fibrous.

For microscopic specimen see *Histological Records*, xxxvi. 27970.

II.

ADDENDA.

SERIES I.

DISEASES OF BONE.

RICKETS.

270b. Sections through the Chondral Ends of two Ribs obtained from the body of a child *æt.* 1 year and 7 months, showing the appearances characteristic of rickets. The ends of the ribs are enlarged (beaded), and the specimens also show vascularisation of the cartilage, especially on holding them up to the light and looking at them from either side. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 115.

EXOSTOSIS OF FEMUR.

380b. Section through a Typical Exostosis removed from the lower end of the left femur of a man *æt.* 19 years, just above the condyle on its inner side. There was a history of an injury one year before the exostosis first appeared. The exostosis is encased by hyaline cartilage and consists of cancellous bone. (Fixed in formalin and preserved in glycerine.)

See *Male Surgical Register*, vol. iv. (1897), No. 1383.

SARCOMA OF FEMUR.

481b. Longitudinal section through the Left Femur of a woman aged 18 years, removed by amputation. The growth appears to have started near the epiphysial line, extending from there upwards into the medullary canal and downwards into the lower epiphysis, and outwards into the surrounding tissues. In the lower half of the growth there are several cysts which had been occupied by fluid. Six months later the woman was admitted with enlarged inguinal glands and a recurrence in the stump, for which an amputation at the hip was performed.

Microscopically the specimen was a typical mixed-celled sarcoma, containing numerous giant cells (myeloid cells). (Fixed in formalin and preserved in glycerine)

See *Histological Records*, i. 481b.

See *Female Surgical Register*, vol. v. (1896), No. 2246, and vol. v. (1897), No. 790.

481c. Longitudinal section through the Left Femur of a woman æt. 22 years, removed by amputation. The growth is evidently of periosteal origin, and has invaded the shaft and medullary canal, and also the lower articular end of the bone. Microscopically the growth was a mixed-celled sarcoma with myxomatous and osteoid deposits. (Fixed in formalin and preserved in glycerine.)

See *Histological Records*, i. 481c.

See *Female Surgical Register*, vol. v. (1896), No. 2272.

MELANOTIC SARCOMA.

483a. Section through three Lower Lumbar Vertebrae, infiltrated by a melanotic sarcoma; obtained from the body of a man æt. 31 years. The seat of the primary growth was doubtful, but it must be mentioned that 15 years ago the right eye was removed, having been injured, it is said, by an accident. At the time of admission the left eye was sound. At the post-mortem examination secondary melanotic and unpigmented deposits were found under the skin, dura mater, left orbit behind the eye, thyroid gland, glands of neck, thorax and abdomen, lungs, pleurae, heart, stomach, intestines, liver, gall-bladder, spleen, pancreas, kidneys, bladder, suprarenal capsules, muscles, and testes. (Fixed in formalin and preserved in glycerine.)

For other specimens see the following numbers: 1174f,g,h, 1289a, 1678d, 1728g, 1937a, 2209c, 2276a, 2304b, 2318d, 2330d, 2390d₁,d₂, 2419a, 2797p, 3316b.

See *Histological Records*, i. 483a.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 66; and *Male Medical Register*, vol. v. (1897), No. 34.

DENTIGEROUS CYST.

540a. A Cyst removed by operation from the right inferior maxilla of a boy æt. 11 years. The cyst contained a molar tooth, suspended in the bottle above the cyst. The latter contained also a papillary growth. The tooth was attached to the cyst wall by its smooth fangless base; its crown is well developed. Microscopically the papillary growth consists of a soft connective tissue, in part myxomatous, lined by atypical stratified columnar epithelium. In parts the growth resembles in structure the multilocular cystic tumours of the lower jaw.

Clinical History.—The growth had been noticed two months before the operation. It extended from the second molar tooth to within $\frac{1}{2}$ in. of the angle of the jaw, and extended up the ramus to within $\frac{3}{4}$ in. of the zygoma. The cyst was very tense and distinctly crepitant to touch anteriorly. The teeth were good and healthy.

At the operation it was found that the cyst lay in the substance of the jaw, expanding the latter, which formed a thin shell of bone on the outside, while the inner wall of the cyst was covered by buccal mucous membrane. The cyst shelled out easily, leaving a smooth cavity.

See *Histological Records*, i. 540a.

SERIES II.

DISEASES OF JOINTS.

LOOSE BODIES.

- 720b. Thirty-five Loose Bodies from a Knee-Joint, removed by operation. Four or five were contained in the main cavity of the joint; the remainder were lodged in a large bursal sac in the popliteal space. Only one was attached by a long narrow pedicle, the rest were completely free.

Clinical History:—The patient was a young man *æt.* 19 years. Six years before, the knee had been violently wrenched at football, and the patient was confined to his bed for a month. The bodies had been noticed in the joint for between two and three years, but the exact period of their development was uncertain. He made a good recovery from the operation, and when seen three months afterwards had free movement of the knee, and was able to play tennis and to dance.

Presented by H. Marsh, Esq., F.R.C.S.

SERIES VI.

DISEASES AND INJURIES OF MUSCLES,
TENDONS, AND BURSÆ.**MELANOTIC SARCOMA IN GRACILIS.**

- 1174f. Portion of Musculus Gracilis, showing a black circumscribed nodule of melanotic sarcoma under the aponeurosis, obtained from the same case as Specimen 483a in Series i. (Fixed in formalin and preserved in glycerine.)

For a microscopic specimen see *Histological Records*, vi. 1174f.

For references see Series i. No. 483a.

MELANOTIC SARCOMA IN SARTORIUS.

- 1174g. Section through the Musculus Sartorius showing a large encapsuled nodule of melanotic sarcoma in the muscular substance, obtained from the same case as Specimen 483a in Series i. (Fixed in formalin and preserved in glycerine.)

For references see Series i. No. 483a.

MELANOTIC SARCOMA IN INTERCOSTAL MUSCLE.

- 1174h. Portions of two Ribs with Intercostal Muscle, showing a nodule of melanotic sarcoma in the muscle, obtained from the same case as Specimen 483a in Series i. The pleura has been dissected off. (Fixed in formalin and preserved in glycerine.)

For references see Series i. No. 483a.

BURSA OVER OLECRANON.

1208a. A Large Loculated Bursa, removed by operation from the left elbow of a man *æt.* 56 years. It had been noticed six months before the operation, when it was as large as a walnut. It was fixed on the outer and posterior aspect of the left elbow. The inner surface of the bursal cyst presents a number of nodular and fringe-like bodies, the cavity is traversed by three thick bands, and there were a few free melon-seed bodies in the cyst.

See *Male Surgical Register*, vol. v. (1897), No. 1239.

SERIES VII.
**DISEASES AND INJURIES OF THE PERICARDIUM
AND HEART.**
PYÆMIC PERICARDITIS AND MYOCARDITIS.

1233c. A Heart, obtained from a boy *æt.* 12 years, who died of pyæmia following acute necrosis of the tibia. The heart is covered by shaggy flakes of lymph, and its wall is injected and red, and contains several small abscesses (pyæmic myocarditis). The pericardial fluid was turbid and sero-purulent.

Bacteriological examination revealed the presence of the *Staphylococcus pyogenes aureus* in the tibia, spleen, heart's blood, pericardial fluid, and pericardium. (Fixed in formalin and mounted in glycerine.)

See *Surgical Post-Mortem Register*, (1897), p. 42; and *Male Surgical Register*, vol. i. (1897), No. 746.

SEPTICÆMIA.

1233d. A Heart showing extensive Subpericardial Hæmorrhages, obtained from the body of a man *æt.* 28 years, who died with septicæmia resulting from gangrenous stomatitis. (Fixed in formalin and preserved in glycerine.)

See *Surgical Post-Mortem Register*, (1897), p. 162.

CALCAREOUS PERICARDIUM.

1238a. A Large Hypertrophied Heart encased in a Pericardium, which in parts has become calcareous, and is adherent over the greater part of the heart. The left ventricle has been laid open by a triangular window, and the hypertrophy of its muscular wall is well shown. The mitral valve is apparently sound, and there is practically no fibrosis of the myocardium except below in the septum near the apex. The left auricle is lined by thickened endocardium, and its muscular wall is also somewhat hypertrophied.

Over the right ventricle the calcareous parietal pericardium is not entirely adherent, but is separated from the partly calcareous visceral

layer by a space, which extends into the muscular substance of the left ventricle, and at the autopsy was full of pus. A window has been cut into this space.

The diaphragm is firmly adherent to the overlying part of the parietal pericardium. Anteriorly the pericardium is also firmly adherent to the cardiac walls, and is also in part calcareous, showing, however, numerous nodules, especially on the left side, which are soft to the touch, and are probably filled by the same fluid as was contained in the above-mentioned purulent cavity. One of those nodules is seen in section in the left-hand corner of the window, cut into the left ventricle, and a similar nodule is also seen in the muscular wall of the left ventricle at the base of this window, and others are found near the apex of the heart.

The foramen ovale is patent, but the valves of the heart and large vessels are apparently normal.

At the post-mortem examination the heart with the pericardium weighed 22 ounces. The pericardium was described as forming a strong and rigid casing for the two ventricles, a similar casing embracing the front and side of the right auricle, the left auricle, however, and the back of the right auricle being free. Here and there in this casing were many soft nodules, containing thick, viscid, purulent fluid, as judged from the contents of one of these nodules. The whole of the right ventricle and a portion of the left ventricle were separated from this casing by a cavity containing viscid, curdy, retained pus (about 4 ounces), free from tubercle bacilli, actinomyces, or other micro-organisms. The walls of this cavity are calcareous. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 122; and *Male Medical Register*, vol. iv. (1897), No. 166.

BROWN ATROPHY—ŒDEMATOUS DEGENERATION OF THE EPICARDIAL FAT.

1243a. Heart obtained from a man *æt.* 63 years, who died with columnar-celled carcinoma of the stomach, with secondary deposits in the viscera. The epicardial fat is wasted, and shows the curious "œdematous degeneration" which is characteristic of marasmus and many wasting cachexias. The myocardium is dark in colour from "brown atrophy," and a "milk spot" is visible on the anterior surface of the right ventricle. Observe also the tortuosity of the coronary vessels, which are plainly evident on account of the wasting and disappearance of the fat. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 224; and *Male Medical Register*, vol. i. (1896), No. 192.

SARCOMA OF HEART.

1285c. Portion of a Heart obtained from the body of a man *æt.* 51 years, who was admitted with a sarcomatous growth in the left sterno-mastoid muscle, and who died with sarcoma of the left kidney, with secondary deposits in the right kidney, the left lung, and pleura. A white nodule is

seen in section in the myocardium, and two other nodules are to be found on the surface of the left ventricle. (Fixed in formalin and preserved in glycerine.)

For references and a full account see Series xxviii. No. 2391d.

1289a. Portion of Heart showing secondary melanotic sarcomatous deposits both in the myocardium, under the endocardium, and under the pericardium. The specimen was obtained from the same case as specimen 483a in Series i. (Fixed in formalin and preserved in glycerine.)

For microscopic specimen see *Histological Records*, vii. 1289a.

For references see Series i. No. 483a.

INFECTIVE ENDOCARDITIS.

1299g. The Aortic Valve laid open, showing two cusps covered by vegetations, which are infective. The third cusp was absent, this being due apparently to a congenital defect, and not to disease. Both coronary arteries enter behind the same cusp. Pneumococci were found microscopically in the vegetations. There was otitis media suppurativa, and there were also septic infarcts in the left lung, a fresh hæmorrhagic infarct in the spleen, and an old infarct in the left kidney; the liver was cirrhotic, and has been preserved in Series xxi. No. 2199a.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 353; *Male Medical Register*, vol. v. Part ii. (1896), No. 270; and *Transactions of the Pathological Society*, vol. xlviii. (1897).

1302c. Left Ventricle of a girl æt. 13 years, who died with infective endocarditis following upon otitis media suppurativa. The mitral valve shows on each flap a large mass of vegetation, considerably obstructing the orifice. Some of the chordæ tendinæ are ruptured. The vegetations bacteriologically examined showed the presence of pneumococci. There were septic infarcts in the spleen and kidneys, suppurative foci in the right shoulder and left wrist, and hæmorrhages in different parts of the body. The spleen and right kidney have been preserved in Series xxv. No. 2295f, and Series xxviii. No. 2331e, respectively. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1895), p. 343; and *Female Medical Register*, vol. iv. (1896), No. 196.

1302d. Left Ventricle of a woman æt. 43 years. The mitral valve is thickened at the edges and stenosed, nearly all the cords of the septal flap are ruptured, and the torn ends are thickened, and in parts calcareous. The cavities of the heart are dilated, but the other valves were natural; on the wall of the left auricle was a large area closely studded with minute vegetations. There were no infarcts, but the liver was engorged (nutmeg); it has been preserved in Series xxi. No. 2203b. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 260; and *Female Medical Register*, vol. i. (1896), No. 165.

SERIES IX.

DISEASES AND INJURIES OF THE VEINS.

VARIX.

1576d. Section through an Aneurysm of the right inner Saphenous Vein, removed by operation from a man *æt.* 37 years. The blood has coagulated (during preservation), and the section shows typically the relation of clot and serum to each other. (Fixed in formalin and preserved in glycerine.)

See *Male Surgical Register*, vol. i. (1897), No. 241.

THROMBOSIS.

1578c. Left Subclavian Vein laid open, completely plugged by clot. It was obtained from the body of a man *æt.* 18 years, who died with sarcoma of the femur (with secondary deposits in the lumbar and mediastinal glands). (Fixed in formalin and preserved in glycerine.)

See *Surgical Post-Mortem Register*, (1897), p. 3; and *Male Surgical Register*, vol. i. (1897), No. 1406.

SERIES X.

DISEASES AND INJURIES OF THE LARYNX
AND TRACHEA.**DIPHThERITIC CAST.**

1616c. A Membranous Cast of the Trachea, its bifurcation and the bronchi, obtained from a case of diphtheria in which a tracheotomy had been performed. A clinical account and a reference unfortunately were not to be obtained.

A microscopic specimen has been preserved in the *Histological Records*, x. 1616c.

DIPHThERIA.

1616d. Larynx and Trachea with its bifurcation, together with neighbouring structures of Pharynx, Palate, and Tongue, obtained from the body of a woman *æt.* 30 years. The larynx and trachea are filled with membrane, extending into the bronchi, and found even in the medium size bronchi in the lungs. Bacterioscopically diphtheria bacilli were found in the membrane.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 80; and *Female Medical Register*, vol. ii. (1897), No. 20.

1616e. Larynx obtained from a child *æt.* 18 months. The soft palate, tonsils, back of pharynx and the larynx are thickly covered with a

greyish-white shaggy membrane, which bacterioscopically proved to be of diphtheritic origin. There was also tubercular broncho-pneumonia and tubercular caseation in the bronchial and mesenteric glands. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 291; and *Male Medical Register*, vol. iv. (1896), No. 282.

1618a. Larynx of a child \ae t. 8 months, showing the typical appearances of diphtheria, which had not been diagnosed during life, tuberculosis having been suspected. Microscopically and bacteriologically typical diphtheria bacilli were found in the larynx and trachea.

For microscopic specimen see *Histological Records*, x. 1618a.

See *Female Surgical Register*, vol. ii. (1895), No. 2702; and *Surgical Post-Mortem Register*, (1895), p. 288.

TUBERCULAR DISEASE OF THE TRACHEA.

1633f₁. Larynx and Trachea with the base of Tongue, dissected so as to show the enlarged tracheal glands and the thyroid gland attached to the trachea and larynx. The specimen was obtained from a woman \ae t. 51 years, and it shows extensive tubercular disease of the mucous membrane of the trachea, and a few tubercular ulcers in the mucosa of the larynx below the vocal cords. The lymphatic glands are black with carbon particles and microscopically were tubercular. There was also tuberculosis of the lungs, with tubercular ulcers of the intestines, and a tubercular tumour in the cerebellum, small miliary tubercles on the surface of the kidneys and peritoneum. (Fixed in formalin and preserved in glycerine.)

Two microscopical sections are preserved in the *Histological Records*, x. 1633f₁.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 267; and *Female Medical Register*, vol. ii. (1896), No. 158.

SINGER'S NODULE.

1634c. Right Half of a Larynx obtained from a man \ae t. 30 years, who died with a malignant growth in the mediastinum. The vocal cord shows a minute nodule at the junction of the anterior and middle thirds, which corresponded exactly in position to one (a little larger) on the opposite side.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 347; *Male Medical Register*, vol. iii. (1896), No. 213; and *Transactions of the Laryngological Society*, (1897).

SARCOMA OF TRACHEA.

1658a. The specimen, which was obtained from the body of a woman \ae t. 35 years, shows the bifurcation of the trachea opened from behind. At the angle of the bifurcation there is a small growth which microscopically proved to be a very vascular sarcoma. It was secondary to a sarcoma of the left kidney, and there were secondary deposits in the lungs.

See *Histological Records*, x. 1658a.

See *Surgical Post-Mortem Register*, (1893), p. 252.

SERIES XI.

DISEASES AND INJURIES OF THE PLEURA,
BRONCHIAL TUBES, AND LUNGS.**CARCINOMA OF PLEURA.**

- 1678b. A Portion of Lung (lower lobe), obtained from the body of a woman *æt.* 21 years, who died a month after an ovariectomy. The pleural surface of the lung is studded with numerous small growths, which microscopically proved to be columnar-celled carcinoma. The peritoneum was studded with growths, and a portion of the omentum has been preserved in Series xvi. No. 1886c₁. (Fixed in formalin and preserved in glycerine.)

The original ovarian tumour was cystic, and contained much solid growth, which microscopically was found to be columnar-celled carcinoma.

See *Female Medical Register*, vol. vi. (1897), No. 230; and *Surgical Post-Mortem Register*, (1897), p. 149.

- 1678c. Sarcoma growing from the Pleural Surface of the Chest Wall, obtained from the body of a man *æt.* 51 years. The growth appeared secondarily to a sarcoma in the kidney. Microscopically the growth is a mixed-celled sarcoma. (Fixed in formalin and preserved in glycerine.)

For a full account of the case see Series xxviii. No. 2391d, where also the necessary references will be found.

MELANOTIC SARCOMA UNDER PLEURA.

- 1678d. Portions of four Ribs showing two Nodules of Melanotic Sarcoma under the Pleura, obtained from the same case as Specimen No. 483a in Series i. (Fixed in formalin and preserved in glycerine.)

For references see Series i. No. 483a.

- 1678e. Portion of Lung showing several Melanotic Sarcomatous Deposits situated under the Pleura. They are intensely black in colour, and two of them are pedunculated. The specimen was obtained from the same case as Specimen 483a in Series i. (Fixed in formalin and preserved in glycerine.)

For microscopic specimen see *Histological Records*, xi. 1678e.

For references see Series i. No. 483a.

BRONCHIECTASIS.

- 1679c. Piece of Left Lung removed from the body of a man *æt.* 30 years, who died after the rupture of an empyema into the right lung. There is recent pleurisy, and the pleura covering the lower portion of the lung is thickened. The lung substance is firm and consolidated, especially below; the bronchial tubes are dilated and lined by a thickened mem-

brane, which is especially well marked below; there is also an increase of fibrous tissue. No tubercle was found. The lower lobe of the right lung showed numerous small cavities filled with pus which had escaped from the empyema into the lung. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 103; and *Male Medical Register*, vol. iii. (1897), No. 84.

INTERSTITIAL EMPHYSEMA.

1693a. Piece of Lung from a male infant *æt.* 9½ months, who died with whooping-cough, showing interstitial or interlobular emphysema, due to the escape of air beneath the pleura and into the tissue. The surface of the upper lobe is covered by a number of air bubbles. On its cut surface the lung shows no emphysema, but broncho-pneumonic consolidation around the bronchi. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 32.

BRONCHO-PNEUMONIA.

1696a₁. Left Lung of a rickety child *æt.* 10 weeks, which shows the external appearances of collapse and broncho-pneumonia. The airless and solid portions are darker in colour and sunk below the surface; the lighter areas still contain air. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 279.

1696a₂. Section of the Right Lung of the same infant from whom the previous specimen was taken. The cut surface shows the macroscopic appearances of broncho-pneumonia extremely well. Observe a number of white nodules, the broncho-pneumonic patches, and the general collapse in the lower part, which corresponds to the dark coloured area of the surface. (Fixed in formalin and preserved in glycerine.)

See the previous specimen.

ŒDEMA OF LUNG.

1702a. Section of Upper Lobe of Left Lung, obtained from a man *æt.* 34 years, who died after rupture into the left bronchus of an aneurysm of the thoracic aorta. On the surface of the section there are several irregular red or rusty patches, especially at the apex, produced by blood which has been inhaled or aspirated into the alveoli. The rest of the surface is grey in colour and solid in appearance (resembling grey hepatisation), and at the time of the necropsy sank in water. This condition is due to general œdema of the lung. (Fixed in formalin and preserved in glycerine.)

A microscopic specimen has been preserved in the *Histological Records*, xi. 1702a. See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 288; and *Male Medical Register*, vol. iv. (1896), No. 220.

NECROTIC INFARCT.

1709b. Portion of a Lung from a woman *æt.* 26 years, showing a necrotic infarct (gangrene). The appearances are described in the post-mortem

book as follows:—"On the posterior aspect of the left lower lobe, close to the base, is a cavity as large as a large walnut, from which comes a quantity of dirty greenish pus; in the midst of this there is a large sequestrum of lung tissue which almost fills the cavity. The latter is lined by a distinct pyogenic membrane." There were several infarcts in the right lung, mostly old and decolorised. Both lungs were indurated generally, but not brown in colour, and there was a pleural effusion on the right side; no infarcts in the spleen or kidneys. There can be little doubt that the appearances in the specimen are due to breaking down of an infarct; the sequestrum is still engorged with blood. The thickening of the pleura is well shown.

See *Medical Post-Mortem Register*, vol. xxii. (1896), p. 333; and *Female Medical Register*, vol. iv. (1895), Part ii. No. 198.

TUBERCULAR LUNG AND PULMONARY ANEURYSM.

1718c₂. Section through the Right Lung obtained from a woman *æt.* 22 years. The lung substance is completely consolidated, except in parts where it is extensively ulcerated. In the upper lobe there is a cavity showing considerably thickened vessels, but the main mass is yellowish and caseous. The lower lobe shows much breaking down lung tissue, and here the vessels are enormously thickened. Below there is a comparatively large pulmonary aneurysm, the wall of which is thickened and the contents of which consist of freshly coagulated blood. The pleura is considerably thickened and the lobes are adherent to each other, forming one solid mass, the lobes being marked off by thickened bands of fibrous tissue.

The woman during life had considerable hæmoptysis; the left lung had no pleural adhesions, but was thickly beset with tubercles (tuberculous broncho-pneumonia) of much more recent date. (Fixed in formalin and preserved in glycerine.)

The liver, which was fatty, has been preserved in Series xxi. No. 2193.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 334; and *Female Medical Register*, vol. iv. (1896), No. 178.

TUBERCULAR BRONCHO-PNEUMONIA.

1718c₃. Right Lung of a girl *æt.* 2 years, who died with acute miliary tuberculosis. The surface of the lung shows pleurisy at the base and numerous tubercles under the pleura, especially at the base. The lung is evidently in a condition of broncho-pneumonia, and there is also a small caseous gland at the root of the lung. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. p. 70; and *Female Medical Register*, vol. ii. (1897), No. 43.

ACUTE TUBERCULOSIS.

1719b. Section through a Lung of a girl *æt.* 10 years, showing typical general acute tuberculosis. The tubercles stand out prominently as whitish or grey bodies from the dark and congested background. The

child had died of acute general tuberculosis. (Fixed in formalin and preserved in glycerine.)

The spleen of the same case has been preserved in Series xxv. No. 2301c.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 262; and *Female Medical Register*, vol. v. (1896), No. 116.

CHRONIC TUBERCULOSIS.

1719c. Section of a Left Lung obtained from a man *æt.* 45 years. It shows the typical appearances of chronic tuberculosis. The pleura over the apex is considerably thickened, and here the lung is fibroid, and the bronchi appear thickened. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 35; and *Male Medical Register*, vol. iii. (1897), No. 32.

SARCOMA OF LUNG.

1728e. A Large Growth which had occupied the whole of the left side of the chest and lung, with the exception of a small portion of lung at the apex. It is firm and somewhat nodular, and was not adherent either to the vertebræ or the ribs. The mass contains many cartilaginous nodules, and above is a large cyst which had contained a quantity of blood-stained fluid. Microscopically the growth is a chondro-myxosarcoma.

In the right lung, closely adherent to the bodies of the lower dorsal vertebræ, was another but much smaller mass of growth. The pleural cavity was obliterated on the left side, and partially so on the right side.

The growth was obtained from a girl *æt.* 15 years, who a year before death had been operated upon for a periosteal sarcoma of the lower end of the right femur. Her right leg was amputated through the middle of the thigh. The tumour was a myxo-chondro-sarcoma.

See *Transactions of the Pathological Society*, London, vol. xlv. (1895), p. 33.

Presented by Stephen Paget, Esq.

1728f. Section through the Left Lung of a woman *æt.* 60 years. At the root of the lung there is a new growth, forming a dense mass, white in colour, extending into the surrounding lung substance, obstructing the primary bronchus, so that it is reduced to a slit. The pleura is considerably thickened, especially above. In the lower half of the lung there are numerous purulent foci, probably bronchiectatic in origin, which at the post-mortem examination were described as follows:—"Innumerable small rounded cavities filled with pus; these cavities, only one of which was larger than a shilling in circumference, were no doubt bronchiectatic, after obstruction of their bronchial tubes."

On turning the specimen round, the growth is seen surrounding and obstructing the left bronchus, and extending upwards behind the aorta; the pleura is greatly thickened.

There were no enlarged lymphatic glands, according to the description in the post-mortem book; the glands at the bifurcation of the trachea were calcareous, but not infiltrated with growth. (Fixed in formalin and preserved in glycerine.)

Histologically the growth is a round-celled sarcoma.

The kidneys were granular and suppurating, and the bladder also congested and inflamed (cystitis).

The left kidney has been preserved in Series xxviii. No. 2338c.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 344; and *Female Medical Register*, vol. v. (1896), No. 160.

1728g. Section of the Lower Lobe of the Left Lung of a man *æt.* 51 years, who died with sarcoma of the kidney, with secondary deposits in the left pleura and lung and the heart. The lung shows on its cut surface a large triangular area, whitish and mottled, and several large and small nodules on the pleural aspect. Microscopically the growth is a sarcoma. (Fixed in formalin and preserved in glycerine.)

For references and full account see Series xxviii. No. 2391d.

SECONDARY CARCINOMA OF LUNG.

1729b. Portion of Lung from a man *æt.* 63 years, who died with columnar-celled carcinoma of the stomach, with secondary deposits in the liver, lungs, &c. The specimen shows numerous carcinomatous deposits, distinguished by their white colour, which microscopically proved to be columnar-celled carcinomatous growths. (Fixed in formalin and preserved in glycerine.)

For specimen of liver see Series xxi. No. 2216f.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 224; and *Male Medical Register*, vol. i. (1896), No. 192.

1744a. A Portion of the Left Lung containing very numerous oval and spherical masses of cartilage, varying in size from less than a line to $1\frac{1}{2}$ inch (.2-3.75 cm.) in diameter, embedded in healthy pulmonary structure, from which, though closely connected, they can be easily and almost cleanly shelled out. Each separate nodule consists histologically mainly or entirely of cartilage, but in the neighbourhood there are cancerous alveoli lined by columnar epithelium.

This specimen forms part of a series, viz., Testis, Series xxxvi. 2784; Growth in Vena Cava, 2785; Growth in Spermatic Plexus, 2786; and Growth in Spermatic Cord, 2787. The primary growth was in the testis, and had originally been described by Sir James Paget as a chondroma testis, but was recently shown to be a chondro-carcinoma.

Remainder of lung preserved in the Royal College of Surgeons (No. 3411, R.C.S. Museum).

For microscopic specimen of the lung see *Histological Records*, xi. 1744a.

See *Journal of Pathology and Bacteriology* (London and Edinburgh), vol. v. (1897); and *Transactions of the Pathological Society*, London, vol. xlviii. (1897), p. 149.

Presented by the Royal College of Surgeons.

THROMBOSIS OF PULMONARY ARTERY.

1750a. Portion of Lower Lobe of the Left Lung of a girl *æt.* 17 years, who apparently died after an attack of pneumonia. There is a ragged cavity in its lower part behind, which contained greenish liquid pus, and represents

a superficial abscess. There is further an extensive thrombosis of the larger branches of the pulmonary artery (seen from the front), which have been opened. In the right lung these were also thrombosed, the main branches to both upper and lower lobes being involved, while in the left lung the thrombosis was limited to the branches of the lower lobe only. The clots are firm, opaque, adherent, and of a yellow colour, forming branching casts of the vessels. There was recent lymph over the right pleura, especially at the apex and the extreme base, fibrinous matter over the left lower lobe, in the meshes of which lay a little purulent fluid. A plexus of thrombosed veins was found in the cellular tissue around the cervical end of the uterus. In the heart's blood and spleen the *Staphylococcus pyogenes aureus* was found. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 18; and *Female Medical Register*, vol. iv. (1897), No. 28.

SERIES XII.

DISEASES OF THE NOSE, MOUTH, TONGUE, PALATE, AND FAUCES.

TUBERCLE OF SEPTUM NASI.

1763b. A Small Growth removed by operation from the septum nasi of a girl *æt.* 10 years, which microscopically proved to be tubercular (*lupus nasi*). She had had suppurating tubercular glands in the neck, and 7 years before admission the nose became swollen, and a "polypus" was removed. On admission, nasal respiration through the right nostril was difficult; there was a yellow discharge, and on the septum a mass of granulations.

See *Histological Records*, xii. 1763b.

See *Female Surgical Register*, vol. iv. (1897), No. 568.

EPITHELIOMA OF TONGUE.

1788h₁. Section of a Tongue removed by operation from a man *æt.* 59 years. It shows a typical ulcerating squamous-celled carcinoma: the infiltration of the muscular substance is extremely well seen. (Fixed in formalin and preserved in glycerine.)

For microscopic section see *Histological Records*, xii. 1788h₁.

See *Male Surgical Register*, vol. iii. (1896), No. 3436.

EPITHELIOMA OF FLOOR OF MOUTH.

1788h₂. Section through the tip of the Tongue and adjoining parts of the floor of the mouth of a man *æt.* 62 years. The under surface of the tongue is invaded by a malignant growth which microscopically proved to be a squamous-celled carcinoma. (Fixed in formalin and preserved in glycerine.)

See *Male Surgical Register*, vol. v. (1897), No. 376.

POLYPUS OF THE TONSIL.

1807b₁. Portion of the Right Tonsil with a Fibrous Polypus projecting from one of the follicles of the tonsil. The affected portion of the tonsil was shelled out from its bed. The patient was a woman *æt.* 42 years. It is uncertain how long the tumour had been present, but it had only been observed during four weeks before it was removed. (Fixed in formalin and preserved in glycerine.)

A microscopical specimen is preserved in the *Histological Records*, xii. 1807b₁.

Presented by H. T. Butlin, Esq., F.R.C.S.

SERIES XIV.
DISEASES OF THE SALIVARY GLANDS.**PAROTID TUMOUR.**

1831b. Section of a Tumour removed from the right parotid region of a man *æt.* 35 years. The tumour, according to the history given, had been first noticed 16 years ago, when it was of the size of a pea, and had gradually grown to the size of a cricket-ball. Histologically the growth is a fibromyxoma.

See *Male Surgical Register*, vol. i. (1897), No. 513.

MELANOTIC SARCOMA OF PAROTID GLAND.

1832a₁. An intensely black Melanotic Sarcoma which grew in the left parotid region of a man *æt.* 55 years, and was removed by operation. It had been first noticed eight months before. (Fixed in formalin and preserved in glycerine.)

See *Histological Records*, xiv. 1832a₁.

See *Male Surgical Register*, vol. v. (1896), No. 2298.

1832a₂. A Melanotic Sarcoma removed from the parotid region of a man *æt.* 66 years.

History.—Four years before removal a small lump had been noticed below the angle of the jaw, which in 3½ years reached the size of a hen's egg, and since then had been growing rapidly. The tumour was situated almost wholly below the level of the lobule of the ear, only its upper part being in the parotid region; downwards it extended to within an inch of the clavicle.

A microscopic section is preserved in the *Histological Records*, xiv. 1832a₂.

See *Male Surgical Register*, vol. iii. (1894), No. 575.

SERIES XV.

DISEASES AND INJURIES OF PHARYNX AND
ESOPHAGUS.**GANGRENOUS DIPHThERIA.**

1837b. Larynx and adjoining parts of Pharynx of a child \ae t. 4 years, who died with hæmorrhagic diphtheria. The tonsils and pharynx are covered by necrotic discoloured material, which extends downwards into the larynx. Bacterioscopically the diphtheria bacillus and streptococci were found in the necrotic masses. (Fixed in formalin and preserved in glycerine.)

See *Histological Records*, xv. 1837b.

For further notes on the same case see Series xvii. No. 1918c.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 360; *Female Medical Register*, vol. iii. Part i. (1896), No. 145; and *Journal of Pathology and Bacteriology* (London and Edinburgh), vol. iv. (1897), p. 424. Paper by J. W. W. Stephens and C. D. Parfitt.

SERIES XVI.

DISEASES OF THE PERITONEUM, OMENTUM,
AND MESENTERY.**TUBERCULAR PERITONITIS.**

1883c. Piece of Diaphragm obtained from the body of a man \ae t. 27 years, who died of general miliary tuberculosis. The peritoneal surface of the diaphragm is thickly studded with grey miliary tubercles. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 110; and *Male Medical Register*, vol. ii. (1897), No. 98.

OMENTAL CYSTS.

1885e. A Portion of the Great Omentum removed by operation from a woman \ae t. 33 years. At the operation the omentum was found to be full of cysts, varying in size from a Tangerine orange to a split pea. The cysts were soft and smooth and not very tense, and those near the free border were larger than those near the colon, and the larger ones were attached to the omentum by a pedicle, as though they were becoming free. Each cyst contained a clear watery fluid. The condition had not been diagnosed, and the operation was undertaken for the removal of an inflamed and thickened appendix vermiformis. Finding this cystic formation, the omentum was removed. The appendix was

considerably thickened, but free from adhesions; it was removed. The patient made an uninterrupted recovery. From the microscopic examination it appears that the cysts are inflammatory in origin; they are lined by flat endothelial cells. (Fixed in formalin and preserved in glycerine.)

See *Histological Records*, xvi. 1885e.

See *Female Surgical Register*, vol. ii. (1897), No. 408; and *Transactions of Pathological Society* (London), vol. xlviii. (1897).

CARCINOMA OF PERITONEUM.

1886c₁. A Portion of the Great Omentum obtained from the body of a woman *æt.* 21 years, who died a month after an ovariectomy performed for a malignant growth of the ovary. The whole peritoneum was studded with growths, and these microscopically proved to be columnar-celled carcinoma. Other secondary deposits were found in the liver, mediastinal glands, lumbar and cervical glands, and pleura. The pleural metastatic deposits have been preserved in Series xi. No. 1678b. (Fixed in formalin and preserved in glycerine.)

See *Female Medical Register*, vol. vi. (1897), No. 230; and *Surgical Post-Mortem Register*, (1897), p. 149.

SARCOMA OF GREAT OMENTUM.

1886c₂. A Portion of the Transverse Colon with the Great Omentum attached to it, obtained from the body of a girl *æt.* 15 years. The omentum has been converted into a crumpled up nodular mass, which microscopically presented the same appearances as have been described in Specimen 1886e₁. The growth is either a sarcoma or an endothelioma. (Fixed in formalin and preserved in glycerine.)

For references and full account see No. 1886e₁ in this Series.

SARCOMA IN APPENDICES EPIPLOICÆ.

1886e₁. A Loop of Large Intestine, obtained after death from a girl *æt.* 15 years, which shows enlarged appendices epiploicæ, which microscopically were found to be infiltrated by a curious sarcomatous or endotheliomatous growth. (Fixed in formalin and preserved in glycerine.)

Post-Mortem Notes:—The under-surface of the diaphragm was covered with small growths, the great omentum was crumpled up and converted into a nodular mass; the mesentery, at its intestinal insertion, was also covered by growths, and the appendices epiploicæ were generally enlarged; many mesenteric glands were infiltrated, there were no growths in the substance of the liver, spleen, and kidneys, but the left suprarenal capsule, ovary, and pancreas were invaded by growths; the pericardium, myocardium, bronchial glands, and pleura all showed secondary deposits, as well as the right lung; above the left clavicle there also was a mass of enlarged glands. The surface of the body was generally pigmented.

The omentum has been preserved in this Series, No. 1886c₂.

See *Histological Records*, xvi. 1885e₁.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 148; and *Female Medical Register*, vol. iii. (1897), No. 76.

SARCOMA OF PERITONEUM.

1886g. A Portion of Small Intestine, obtained after death from a man æt. 49 years. Near the mesenteric border there are several nodules, varying in size and shape, one of which has been cut across and is discoloured by blood. These growths proved to be sarcomatous, and a microscopic section has been preserved in the *Histological Records*, xvi. 1886g. The growths are situated under the serous surface, and the lumen of the gut is free.

Presented by W. J. C. Keats, Esq.

SERIES XVII.
DISEASES AND INJURIES OF THE STOMACH.**MULTIPLE HÆMORRHAGES.**

1918c. The Stomach of a child æt. 4 years, who died with hæmorrhagic diphtheria. The mucosa shows numerous hæmorrhagic spots, undoubtedly of "septic" origin. The diphtheritic process had attacked the whole of the fauces, pharynx, and naso-pharynx, which were necrotic and gangrenous, but the larynx and trachea were macroscopically almost free, the epiglottis being invaded from the pharynx and fauces. Diphtheria bacilli were found in the naso-pharynx, tonsils, larynx, trachea, lungs, kidneys, spleen, and heart's blood; streptococci were also found in the blood, spleen, and bone-marrow, so that this was an instance of mixed infection. During life there were a few purpuric spots over the body, especially in the groin, and a few behind the ears. The purpura and the petechiæ of the stomach were certainly septicæmic in origin. (Fixed in formalin and preserved in glycerine.)

For histological specimen of the stomach see *Histological Records*, xxvii. 1918c.

The petechiæ contained both streptococci and diphtheria bacilli. There were also numerous petechial hæmorrhages on the surface of the liver (see Series xxi. No. 2207a).

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 360; *Female Medical Register*, vol. iii. Part i. (1896), No. 145; and *Journal of Pathology and Bacteriology* (London and Edinburgh), vol. iv. (1897), p. 424. Paper by J. W. Stephens and C. D. Parfitt.

CARCINOMA OF STOMACH.

1935b. Portion of a Stomach obtained from the body of a man æt. 58 years. The stomach was slightly dilated, and its wall was nearly everywhere infiltrated with new growth, which along the lesser curvature and near the pylorus forms a dense mass. The pylorus was much stenosed, barely admitting the tip of the little finger. The liver contained a few nodules of new growth and the peritoneum was studded everywhere with nodules of whitish colour, and the omentum, nearly an inch (2.5 cm.) in thickness, was considerably infiltrated with growth. Micro-

scopically the gastric growth proved to be a colloid columnar-celled carcinoma. (Fixed in formalin and preserved in glycerine.)

See *Histological Records*, xvii. 1935b.

See *Male Medical Register*, vol. iii. (1896), No. 2736; and *Surgical Post-Mortem Register*, (1896), p. 206.

MELANOTIC SARCOMA OF STOMACH.

1937a. A Piece of the Wall of the Stomach showing a black nodule of melanotic sarcoma, obtained from the same case as Specimen 483a in Series i. (Fixed in formalin and preserved in glycerine.)

For full references see Series i. 483a.

CARBOLIC ACID POISONING.

1949e. Portion of Stomach (fundus and cardiac end) obtained from a man *æt.* 57, who committed suicide by swallowing carbolic acid. The mucosa of the stomach was necrotic, swollen, and white in appearance; much of it was washed away by a gentle stream of water, leaving alternating bands of exposed muscular tissue and areas of necrotic mucous membrane. The duodenum and upper part of the small intestine were acutely inflamed. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 129.

GASTRO-JEJUNOSTOMY.

1951a₁. A Stomach from a woman *æt.* 36 years, which has been laid open from behind. The pylorus shows a cancerous growth causing a serious obstruction. By means of a Murphy's button the jejunum has been joined to the stomach. The woman died a few days after the operation.

See *Female Surgical Register*, vol. iii. (1897), No. 1269; and *Surgical Post-Mortem Register*, (1897), p. 142.

CARCINOMA OF PYLORUS (Pylorectomy and Enterectomy).

1951d. The specimen represents a growth of the Pylorus with a portion of the Transverse Colon adherent to it, which was removed by operation from a woman *æt.* 39 years. Microscopically the growth is a columnar-celled colloid carcinoma (see *Histological Records*, xvii. 1951d). The woman died the day after the operation.

See *Female Surgical Register*, vol. ii. (1896), No. 1765; and *Surgical Post-Mortem Register*, (1896), p. 173.

SERIES XVIII.

DISEASES AND INJURIES OF THE INTESTINES.

ATROPHY OF THE MUCOUS MEMBRANE.

1955a. A Piece of Large Intestine obtained from the body of a woman *æt.* 22 years, who died with a gastric ulcer (repeated hæmatemesis). The large intestine, from the ileo-cæcal valve to three inches above the anus, pre-

sented a remarkable appearance, the mucosa being studded with pale yellowish flat-topped projections, which in places had run together into raised areas. Microscopically it was found that the condition is not due to changes in the lymphoid follicles, but in the raised areas the glands of Lieberkühn are swollen and in a catarrhal condition, the surface being covered by a pseudo-membranous exudation, secretion, or detritus; in the intermediate portions the mucosa is atrophied, the glands having disappeared and the papillæ being thickened and fibrosed.

A microscopical section is preserved in the *Histological Records*, xviii. 1955a.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 65; and *Female Medical Register*, vol. ii. (1897), No. 45.

INFECTIVE EMBOLUS.

1956d. Piece of Small Intestine, showing a number of small purulent collections under the peritoneum, which were embolic (pyæmic) in origin. The specimen was obtained from a girl æt. 15 years, who died with infective endocarditis. There were numerous "septic" infarcts in the lungs, myocardium, and kidneys, but none in the spleen. The right sterno-clavicular joint was full of pus, which had infiltrated the soft tissues around; there was also an abscess in connection with the left iliac bone. This was probably the primary source of infection. Bacteriological examination revealed the presence of the *Staphylococcus pyogenes aureus* in the abscess near the iliac bone, the spleen, and kidneys. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 235; and *Female Medical Register*, vol. i. (1896), No. 179.

1956e. A Portion of Small Intestine obtained from a girl æt. 14 years, who died with infective endocarditis, secondary to an intra-abdominal abscess in the neighbourhood of the cæcum. On the serous surface near the mesenteric border is a varicose and tortuous, moniliform white cylindrical mass, evidently suppurative in nature, which must have been produced by an infective embolus (*i.e.* a hæmic metastatic deposit). It distinctly follows the course of a vessel. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 139.

MULTIPLE POLYPI OF SMALL INTESTINE.

2019f₁. A Piece of Small Intestine obtained from the body of a girl æt. 14 years, who died of infective endocarditis. The mucous membrane is studded with minute multiple polypi. The whole intestine was studded in similar manner, and they were densest in the jejunum. Their distribution is the same as in Specimen No. 2019e.

For microscopic specimen see *Histological Records*, xviii. 2019f₁.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 152.

MELANOTIC SARCOMA.

2026a. A Piece of Small Intestine obtained from the body of a woman æt. 72 years, who died with melanotic sarcomatous deposits in the orbit,

liver, and other organs. The mucous surface shows numerous small melanotic nodules, which microscopically proved to be sarcomatous.

At the post-mortem examination the small intestine showed on its mucous surface a large number of very small raised black growths. They were distributed fairly evenly, and were nowhere close together. They were most numerous in the upper part of the jejunum, and the colon only showed one or two specks. In the stomach there were three or four melanotic spots. Secondary deposits were found in the skin, in the bones of the skull, the dura mater, the œsophagus, the thyroid gland, trachea, and bronchial glands, in the pleura, heart, liver, spleen, kidneys, cœliac and mesenteric glands, uterus, and vertebræ.

The primary growth had been in the right eye, which had been removed thirteen months before death.

A microscopic section is preserved in the *Histological Records*, xviii. 2026a.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 26; and *Female Medical Register*, vol. i. (1897), No. 21.

IMPACTED GALL-STONE.

2030a. Portion of Jejunum obtained from the body of a man æt. 58 years, who died from the effects of acute intestinal obstruction. The gut is completely obstructed by a large cylindrical rather rough gall-stone, measuring 35 mm. × 25 mm., lying with its long axis in the axis of the intestine. The stone has been exposed by a window cut into the wall of the jejunum. There was no ulceration or perforation of the bowel; the stone could be pushed up, but not downwards.

The duodenum of this case was perforated, and has been preserved in Series xxii. No. 2261a.

See *Surgical Post-Mortem Register*, (1897), p. 100; and for history and other references see Series xxii. No. 2261a.

PAPILLOMA OF VERMIFORM APPENDIX.

2036a. A Vermiform Appendix obtained from the body of a man æt. 73 years, who died with carcinoma of the rectum. It has been slit open, and shows three papillomatous growths on the mucous membrane.

Microscopically the growths are ordinary innocent delicate papillomas lined by typical columnar epithelium.

See *Histological Records*, xviii. 2036a.

Presented by A. E. Druitt, Esq.

SERIES XIX.

DISEASES OF THE RECTUM AND ANUS.

SUBMUCOUS HÆMORRHAGE.

2061a. Portion of the Wall of the Rectum showing a small submucous hæmorrhage. The specimen was obtained from the body of a man æt. 52 years, who died with purpura hæmorrhagica. There were also subcutaneous hæmorrhages (purpuric spots), sub-pericardial, sub-endocardial, and sub-peritoneal hæmorrhages. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 163; and *Male Medical Register*, vol. iv. (1896), No. 135.

SERIES XX.

HERNIÆ, OR PROTRUSIONS AND OTHER DIS-
PLACEMENTS OF THE INTESTINAL CANAL
AND OMENTUM.

GANGRENE OF GUT—STRANGULATED FEMORAL HERNIA.

2106b. A Small Loop of Gut which had been strangulated in a femoral hernia (left side) and had become gangrenous. The loop was successfully removed by operation from a woman æt. 41 years. (Fixed in formalin and preserved in glycerine.)

See *Female Surgical Register*, vol. iii. (1897), No. 283.

2106c. Piece of Small Intestine four inches long, which was removed by operation from a woman æt. 44 years, who was admitted with a strangulated ventral hernia. Three inches (7.5 cm.) of the gut are seen to be in a gangrenous condition, the walls being very much thinned in places and of a greyish-black colour; at each end there is a tight constriction marking the site of the strangulation. The patient made a good recovery. (Fixed in formalin and preserved in glycerine.)

See *Female Surgical Register*, vol. ii. (1897), No. 1376.

HERNIA OF THE VERMIFORM APPENDIX.

2111a₁. Specimen obtained from a man æt. 45 years, who died with carcinoma of the stomach, complicated by perforation of the stomach and general peritonitis. The vermiform appendix is unusually long, and protruded through the right femoral ring, forming a hernia. The appendix is adherent to the ring, and can be seen protruding through the ring into the thick sac. There were no symptoms during life.

See *Medical Post-Mortem Register*, vol. xxii. (1895), p. 195; *Transactions of the Pathological Society* (London), vol. xlviii. (1897); and *St. Bartholomew's Hospital Reports*, vol. xxxii. (1896), p. 93.

SERIES XXI.

DISEASES AND INJURIES OF THE LIVER.

2193. Section of a Liver showing the appearances characteristic of "fatty changes." The specimen was obtained from a woman æt. 22 years, who died of phthisis pulmonalis.

The right lung has been preserved in Series xi. No. 1718c₂.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 334; and *Female Medical Register*, vol. iv. (1896), No. 178.

TUBERCULAR LIVER.

- 2196a. Piece of Liver of a child *æt.* 2 years, who died of general tuberculosis with tubercular meningitis. The surface of the liver shows numerous typical miliary tubercles. (Fixed in formalin and preserved in glycerine.)

See *Surgical Post-Mortem Register*, vol. xxiv. (1897), p. 9; and *Female Medical Register*, vol. iv. (1897), No. 13.

CIRRHOSIS OF LIVER.

- 2199a. Section of a Liver obtained from a man *æt.* 38 years, who died of infective endocarditis due to pneumococcus infection. The surface of the liver is granular (slightly hob-nailed), and on the cut surface the fibrous changes of cirrhosis are very evident. The liver showed a remarkable malformation; the left lobe was almost wanting, being reduced to a thin triangular leaflet, and the obliterated umbilical vein was quite distinct from the suspensory ligament; the right lobe had its long axis vertical and reached almost to the crest of the ilium, and on its under surface the quadrate and Spigelian lobes could be distinguished; the gall-bladder was natural, but lay in a transverse direction; the right lobe was fissured, but there was no evidence of gummatous changes, past or present. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 353; and *Male Medical Register*, vol. v. Part ii. (1896), No. 270.

NUTMEG LIVER.

- 2203b. Section of a Liver showing the typical appearances of venous engorgement (nutmeg liver). Obtained from a woman *æt.* 43 years, who died with mitral disease. (Fixed in formalin and preserved in glycerine.)

The left ventricle of this case has been preserved in Series vii. No. 1302d.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 260; and *Female Medical Register*, vol. i. (1896), No. 165.

- 2203c. Section of Liver showing the typical appearances of venous engorgement (nutmeg liver). The specimen was obtained from a woman *æt.* 31 years, who died with morbus cordis. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 34; and *Female Medical Register*, vol. ii. (1897), No. 25.

- 2203d. Portion of Liver obtained from a woman *æt.* 20 years, who died with chorea and endocarditis. The specimen shows the typical nutmeg appearance, which is especially evident because the liver substance is markedly fatty, so that the contrast between the light and dark areas is strongly brought out. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 69; and *Female Medical Register*, vol. iv. (1897), No. 99.

PORTAL PYÆMIA.

2206c. Section through the Liver obtained from the body of a boy æt. 16 years, who died from pyæmia which appeared as a complication of inflammation and suppuration in and around the vermiform appendix. The liver on its surface shows numerous suppurative foci, and on its cut surface innumerable small abscesses distributed around the portal vein, as is especially well shown in the upper part of the specimen.

There were abscesses on the surface and in the substance of the lungs, especially in the lower lobes, but none in the spleen and kidneys. A fæcal abscess cavity was found in the retro-peritoneal tissue, beneath the cæcum, extending to the middle line and as high as the duodenum; the duodenum, ascending colon, and hepatic flexure were firmly matted together by firm adhesions. The cæcum communicated with the abscess by means of an opening admitting a finger and situated on its posterior and inner aspect; the posterior surface of the cæcum was almost gangrenous, and of the appendix nothing could be found. Bacterioscopically streptococci and the *B. coli* were found in the liver and lung. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 5; and *Male Medical Register*, vol. v. (1897), No. 11.

PETECHIAL HÆMORRHAGES.

2207a. Piece of Liver from a child æt. 4 years, who died with hæmorrhagic diphtheria. The liver itself is fatty and pale, and under its capsule are many minute hæmorrhages. (The specimen has been fixed in formalin and preserved in glycerine.)

For further notes and references see Series xvii. No. 1918c.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 360.

MELANOTIC SARCOMA OF LIVER.

2209c. Section through a Liver containing melanotic sarcomatous nodules, obtained from the same case as Specimen 483a in Series i. The masses are roundish in shape and circumscribed, and the pigment is very irregularly distributed, producing large black masses in some places and a mottling in others, while large portions of some nodules are quite unpigmented. The liver weighed 9 lbs. 4 ounces, and was very irregular in shape and greatly enlarged. (Fixed in formalin and preserved in glycerine.)

For microscopic specimen see *Histological Records*, xxi. 2209c.

For references see Series i. No. 483a.

SECONDARY CARCINOMA OF LIVER.

2216f. A Portion of Liver obtained from a man æt. 63 years. It shows the typical appearances of carcinomatous deposits in the liver: the nodular bosses on the surface, their umbilication, their whiteness on section, and the hæmorrhages in the centre of these nodules. One or two of them also show the central degeneration and breaking down. The

primary growth was in the superior and posterior aspect of the stomach, the pylorus being unaffected. There were secondary deposits in the liver and lungs, the pancreas being involved as well, and the hepatic and aortic glands were also infiltrated with growth. Microscopically the carcinoma was of the columnar celled variety. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 224; and *Male Medical Register*, vol. i. (1896), No. 192.

A portion of the lung of this case has been preserved in Series xi. No. 1729b.

RUPTURE OF LIVER.

2241b. The Liver of a girl *æt.* 2 years, which has been ruptured along the longitudinal fissure, a little to the left of the falciform ligament. The rupture was caused by the wheels of a cart which ran over the child, who was brought to the Hospital dead. There was no other injury; the peritoneal cavity contained only 100 cc. of blood.

See *Surgical Post-Mortem Register*, (1897), p. 141.

SERIES XXII.

DISEASES AND INJURIES OF THE GALL- BLADDER AND BILIARY DUCTS.

INTESTINAL OBSTRUCTION.

2261a. The Pylorus and adjoining Portion of the Duodenum, obtained from the body of a man *æt.* 58 years, who died from the effects of intestinal obstruction, due to an impaction of a large gall-stone in the jejunum. The latter, with the gall-stone, has been preserved in Series xviii. No. 2030a. At the back of the first part of the duodenum is a ragged opening, measuring $\frac{3}{4}$ in. (2 cm.) in diameter, leading to the distended common bile duct, through which a green glass rod has been passed. Here—*i.e.* behind the opening—the impacted calculus must have lain until recently before death, for the jejunum showed nothing which pointed to a prolonged impaction. The bile duct, on its proximal side above this opening, was moderately dilated, and the gall-bladder only slightly, if at all, dilated. In the bile duct there was a small rough dark calculus, 10 mm. in diameter, and there were numerous adhesions between gall-bladder, duodenum, and omentum, but none elsewhere in the abdomen. The small intestine was greatly distended between the duodenum and the seat of impaction.

See *Surgical Post-Mortem Register*, (1897), p. 100; *Male Surgical Register*, vol. iv. (1897), No. 1395; and *Transactions of the Pathological Society* (London), vol. xlvi. (1897).

SERIES XXIII.

DISEASES AND INJURIES OF THE PANCREAS.

MELANOTIC SARCOMA OF PANCREAS.

2276b. Section through a Pancreas containing numerous melanotic sarcomatous nodules, obtained from the same case as Specimen 483a in Series i. Some nodules are intensely black, others mottled, and others white. The pancreas weighed 8 ounces (227 grms.)

For microscopical specimen see *Histological Records*, xxiii. 2276b.

For references see Series i. No. 483a.

RUPTURE OF PANCREAS, followed by FAT NECROSIS.

2276d. Specimen of a Pancreas obtained from a man *æt.* 37 years, who died three days after a severe accident, having been crushed between two vans.

The pancreas has been ruptured, and there is a large hæmorrhage in its substance, completely dividing it into two parts. At the post-mortem examination the general peritoneal cavity contained 50-100 cc. of liquid blood; the lesser peritoneal cavity was also full of blood and clots. The stomach and spleen and transverse colon were matted together by old adhesions, but had not been injured. There was, however, considerable bruising and crushing of the pancreas, but the liver and other abdominal organs, the duodenum and rest of the intestines, had escaped injury. Patches of fat necrosis were present in numbers in the omenta, mesenteries, and retro-peritoneal tissue.

On admission, the patient complained merely of slight pain in the epigastrium, and was not considered to have sustained any serious injury; twenty-four hours later, however, he became collapsed, but gradually recovered. Later he was seized with vomiting, which continued for several hours, when he suddenly became collapsed and died. (The specimen has been fixed in formalin and preserved in glycerine.)

Specimen illustrating the fat necrosis has been preserved in Series L. No. 3238m.

See *Male Surgical Register*, vol. v. (1896), No. 3026; and *Surgical Post-Mortem Register*, (1896), p. 226.

SERIES XXIV.

DISEASES OF THE LYMPHATIC GLANDS
AND VESSELS.**LYMPHADENOMA.**

2278b. A Mass of Glands removed by operation from the neck of a girl *æt.* 9 years. Microscopically they showed numerous large epitheloid or

endothelial cells, such as are associated with certain conditions of lymphadenoma. (Fixed in formalin and preserved in glycerine.)

A microscopic section has been placed in the *Histological Records*, xxiv. 2278b.
Presented by James Berry, Esq., F.R.C.S.

SERIES XXV.

DISEASES AND INJURIES OF THE SPLEEN.

SEPTIC INFARCT.

2295f. Section of a Spleen of a girl *æt.* 13 years, who died with infective endocarditis, appearing as a complication of otitis media suppurativa. The section shows a typical septic infarct under the capsule, and a few suppurative foci near the edge of the spleen. Besides otitis media there was pus in the right shoulder-joint and left wrist, a hæmorrhage under the arachnoid, and small spots of hæmorrhage in the bladder and peritoneal surface of the ovaries, and a decolorised clot in the right subclavian artery (probably agony clot), a septic infarct of the right kidney and a fresh infarct in the opposite kidney. The infective endocarditis affected the mitral valve. (Fixed in formalin and preserved in glycerine.)

Portions of the right kidney and heart have been preserved in Series xxviii. No. 2331e, and Series vii. No. 1302c, respectively.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 343; and *Female Medical Register*, vol. iv. (1896), No. 196.

AMYLOID SPLEEN.

2298e. Section through a Spleen showing typical amyloid disease (sago spleen). The suppurative focus was a tropical abscess of the liver. The kidneys, liver, suprarenal bodies, and intestines were also amyloid. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 238; and *Male Medical Register*, vol. i. (1896), No. 103.

TUBERCULAR SPLEEN.

2301b. Half a Spleen and Splenculus, both studded on their cut surface with numerous small tubercles. Tubercles can be seen also on the surface under the peritoneum. The specimen was obtained from a girl *æt.* 2 years. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 7; and *Female Medical Register*, vol. iv. (1897), No. 9.

2301c. Section through the Spleen of a girl *æt.* 10 years, showing typical miliary tubercle scattered through the pulp. Post-mortem there was general tuberculosis (lungs, spleen, liver, kidneys, peritoneum, and

meninges). A section of the lung of the same case has been preserved, see Series xi. No. 1719b. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 262; and *Female Medical Register*, vol. v. (1896), No. 116.

MELANOTIC SARCOMA IN SPLEEN.

2304b. Section through a Spleen showing two roundish, circumscribed nodules on the cut surface and three nodules on the serous surface. The specimen was obtained from a case of multiple melanotic sarcoma, from which also Specimen 483a, Series i. was removed. The nodules are unpigmented. (Fixed in formalin and preserved in glycerine.)

For microscopic specimens see *Histological Records*, xxv. 2304b.

For references see Series i. No. 483a.

SERIES XXVI.

DISEASES OF THE THYROID GLAND.

SUBSTERNA GOITRE.

2312b. Section through a typical Cystic Adenoma from the lower part of the Thyroid Gland, removed by operation from a lady æt. 37 years. It had been growing slowly for several years, and had lately produced very severe attacks of dyspnœa by becoming jammed between the sternum and the trachea. There was very little external swelling. About one half of the tumour lay behind the sternum. The growth was removed by intraglandular enucleation, and showed on its surface a groove or constriction due to pressure (Fixed in formalin and preserved in glycerine.)

For a microscopic specimen see *Histological Records*, xxvi. 2312b.

Presented by James Berry, Esq., F.R.C.S.

CYSTIC ADENOMA.

2314p. A Cystic Adenoma of the Thyroid Gland, from a lady 31 years of age. It had been growing slowly for ten or twelve years. It occupied the left lobe and part of the isthmus, and had lately commenced to trouble the respiration to a slight degree when she took active exercise. It was removed by operation without removing any part of the thyroid gland. (Fixed in formalin and preserved in glycerine.)

Presented by H. T. Butlin, Esq., F.R.C.S.

MELANOTIC SARCOMA OF THYROID GLAND.

2318d. A Larynx with Thyroid Gland, the left lobe of which contains a large nodule of melanotic sarcoma, shown in section. The specimen was obtained from the same case as Series i. No. 483a. (Fixed in formalin and preserved in glycerine.)

For microscopic specimen see *Histological Records*, xxvi. 2318d.

For references see Series i. No. 483a.

SERIES XXVII.

DISEASES OF THE SUPRARENAL BODIES.

HÆMORRHAGIC SUPRARENAL CAPSULE.

2320b. Section through a Kidney and Suprarenal Capsule, removed from the body of a girl æt. 12 months. The suprarenal capsule is deeply hæmorrhagic. (Fixed in formalin and preserved in glycerine.)

Clinical History.—Two days before death she seemed ailing, and passed a little blood per rectum; next day she had a fit, and a few purpuric spots appeared, and soon there was an extensive purpuric eruption all over the body. There was a small umbilicated vesicle on the chest and one or two on the neck and cheeks; the temperature registered 100° Fabr.; the fauces were natural and there was no hæmaturia. She was thought to be suffering from variola, and died next morning. After death the purpuric rash was more copious, several more minute vesicles were found, and some hæmorrhage had taken place into the umbilicated vesicle of the chest. Bacteriological examination of the blood and all the organs by Dr. Andrewes was negative.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 169.

MELANOTIC SARCOMA OF SUPRARENAL CAPSULE.

2330d. Section through a Suprarenal Capsule showing a melanotic deposit, sarcomatous in nature, and several other white nodules, which as yet are unpigmented, but which are also sarcomatous in character. This specimen was obtained from the same case as Specimen 483a in Series i. (Fixed in formalin and preserved in glycerine.)

For microscopic section see *Histological Records*, xxvii. 2330d.
For references see Series i. No. 483a.

SERIES XXVIII.

DISEASES AND INJURIES OF THE KIDNEYS, THEIR
PELVES, AND THE URETERS.**PYÆMIC INFARCT.**

2331e₁. Section of the Right Kidney obtained from a girl æt. 13 years. It shows a typical pyæmic infarct, the kidney substance being pale and cloudy. The child died with infective endocarditis, following upon otitis media suppurativa. There were also septic foci in the spleen, right shoulder-joint, and left wrist, and petechial hæmorrhages in different parts of the body. Portions of the spleen and heart have been preserved in Series xxv. No. 2295f. and Series vii. No. 1302c. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 343; and *Female Medical Register*, vol. iv. (1896), No. 196.

RENAL INFARCT.

2331e₂. Left Kidney obtained from the body of a girl æt. 17 years, who died with morbus cordis (vegetations on mitral valve, not infective in character). The kidney is small, weighing 3 ounces (85.5 grms.), and lobular on its surface, and exhibits a large pale infarct, apparently of some standing. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 95; and *Female Medical Register*, vol. i. (1897), No. 59.

CONTRACTING WHITE KIDNEY.

2334b. Section through the Right Kidney of a woman æt. 37 years, who died of pontine hæmorrhage. The kidney weighed four ounces (114 grms.); the capsule was not adherent, although the surface is very granular and the cortex much diminished. The appearances on the cut surfaces are striking, and the specimen having been fixed in formalin, are well preserved. The pyramids are dark in colour and the cortex mottled, the boundary zone being white. The pale areas and streaks appear on macroscopic examination to be fatty, but microscopically after staining with Marchi's fluid no fat was found corresponding to these white areas and streaks. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 257; and *Female Medical Register*, vol. i. (1896), No. 171.

2334c. Section of a Kidney obtained from the body of a woman æt. 49 years, who died with morbus cordis (thickening of and vegetations on aortic valves, stenosis of and vegetations on mitral valve, hypertrophy and dilatation of the heart, and atheroma of the coronary arteries). The kidney is in a condition of so-called chronic parenchymatous nephritis, being in the contracting stage. The capsule was somewhat adherent, and after removal has left the surface slightly granular, with loss of substance at one point. There is also a small cyst near the hilum. The cortex is pale, and in parts diminished, and there is much fat around the pelvis and calyces. (Fixed in formalin and preserved in glycerine.)

A microscopical section is preserved in the *Histological Records*, xxviii. 2334c.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 100; and *Female Medical Register*, vol. iv. (1897), No. 83.

SUPPURATING KIDNEY.

2338c. Half a Kidney (left) obtained from a woman æt. 60 years, who died with a sarcomatous growth in the mediastinum and lung. The surface is irregular and shows numerous suppurating foci and small cysts. The cut surface shows a small cortex, characteristic of chronic interstitial changes; the capsule was adherent. The opposite kidney was also "granular," and showed a few suppurating foci. The bladder was intensely congested and its mucosa inflamed, and the renal pelvis contained pus. The lung of this case is preserved in Series xi. No. 1728f. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 344; and *Female Medical Register*, vol. v. (1896), No. 160.

ACUTE SUPPURATIVE NEPHRITIS.

2338d. A Kidney obtained from the body of a man æt. 53 years, who had a stricture of the urethra, cystitis, and extravasation of urine. The kidney shows the conditions characteristic of acute ascending suppurative nephritis and of suppurative pyelitis. Numerous purulent foci are seen under the surface, and several others on the cut surface. The kidney substance is greatly altered, and the kidney itself considerably enlarged; both kidneys were similarly diseased. The bladder of this case has been preserved in Series xxix. No. 2405c. (Fixed in formalin and preserved in glycerine.)

A microscopic section is preserved in the *Histological Records*, xxviii. 2338d.

See *Male Surgical Register*, vol. i. (1897), No. 1887; and *Surgical Post-Mortem Register*, (1897), p. 157.

TUBERCULAR KIDNEY.

2341h. Section through a Tubercular Kidney (left) obtained after death from a man æt. 47 years. The specimen shows typical tubercular deposits, mostly in the cortex and under the capsule, which has been partly stripped off. (Fixed in formalin and preserved in glycerine.)

See *Male Surgical Register*, vol. i. (1896), No. 2938; and *Surgical Post-Mortem Register*, (1896), p. 244.

SYPHILITIC KIDNEY.

2343a. Section through the Right Kidney removed by operation from a woman æt. 40 years, which is extremely nodular and fissured on its surface, and densely fibrous on section. The patient was admitted with a swelling in the right lumbar region, accompanied by attacks of sudden pain in the right side. At first movable kidney was diagnosed, but the tumour grew, and from the symptoms hydronephrosis was suspected and the kidney removed. There was a distinct history of syphilis.

A microscopical section is preserved in the *Histological Records*, xxviii. 2343a.

See *Female Surgical Register*, vol. iv. (1894), No. 2368; and *Transactions of the Pathological Society*, vol. xlviii. (1897).

RENAL CALCULUS.

2345c. A Left Kidney divided in two, containing a large branched calculus, which occupies the pelvis and calyces. (The calculus was broken during life, the edges of the fracture being smooth and rounded.) The other kidney was apparently healthy. (Fixed in formalin and preserved in glycerine.)

The specimen was obtained from the body of a man æt. 42 years, who was brought in dead.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 258.

HYDRONEPHROSIS.

2354b. Left Kidney removed by operation from a girl æt. 16 years. The ureter is plugged by a calculus, and the pelvis and calyces behind have become enormously distended, so that the kidney is in a condition of hydronephrosis, and hardly any kidney substance has been left.

See *Female Surgical Register*, vol. ii. (1897), No. 1053.

PYONEPHROSIS AND RENAL CALCULUS.

2358c. A Large Left Kidney removed by transperitoneal operation from a man *æt.* 48 years. A large calculus (oxalate of lime), weighing $4\frac{1}{2}$ ounces (128.2 grms.), fills the distended pelvis, and the kidney itself shows the changes characteristic of pyonephrosis, being distended into a huge multilocular abscess. The patient had had pyuria and pain in the left loin and a renal swelling for nearly twenty years. The kidney contained more than a pint of odourless pus and was universally adherent. The patient died of shock about five hours after the operation.

Presented by C. B. Lockwood, Esq., F.R.C.S.

INTERSTITIAL NEPHRITIS.

2378b. Left Kidney obtained from the body of a man *æt.* 67 years, which shows the typical appearances of interstitial nephritis and a large cortical cyst. The heart was hypertrophied, the arteries extensively atheromatous, the joints of the great toe gouty, the lungs emphysematous and oedematous. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 14.

CYSTIC KIDNEY.

2381b. Left Kidney laid open, showing the changes characteristic of so-called interstitial nephritis, which was obtained from the body of a man *æt.* 49 years, brought in dead. Its surface is slightly granular and studded with cysts, in some places collected in groups; they are filled with yellow colloid material. The substance of the kidney is dark, and the cortex in parts destroyed by the cystic formation; there is much fat around the pelvis. Microscopically there was only a moderate degree of interstitial thickening. Extensive atheroma was found in the aorta, and slight atheroma in the coronary arteries; the heart (left ventricle) was greatly hypertrophied; the lungs were somewhat emphysematous; gouty deposits were found in both great toe joints. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 97.

CYSTIC DISEASE OF KIDNEY.

2381c. Left Kidney obtained from a woman *æt.* 51 years, who died with cellulitis of the arm. The kidney was fixed with formalin and is mounted in glycerine, and has been suspended with its lower end upwards. It presents a large number of cysts, most numerous at the lower end, where they form a large irregular mass. The opposite kidney was "granulated" and free from cysts; its capsule was adherent and the cortex greatly diminished in breadth. (Fixed in formalin and preserved in glycerine.)

See *Surgical Post-Mortem Register*, (1896), p. 211; and *Female Surgical Register*, vol. iv. (1890), No. 2264.

MULTILOCULAR CYSTIC DISEASE OF KIDNEY.

2383a. Right Kidney removed from the body of a man *æt.* 49 years, which is greatly enlarged and converted into a mass of cysts (multilocular cystic

disease). The left kidney was similarly altered, and weighed 26 ounces (737 grms.), the right weighing 24 ounces (680 grms.). Four years ago a Wheelhouse's operation had been performed for stricture, and at the time of the post-mortem examination the urethra admitted a No. 10 catheter with difficulty; there were cystitis and some hypertrophy of the bladder wall, but the ureters were not dilated. (Fixed in formalin and preserved in glycerine.)

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 176.

MELANOTIC SARCOMA OF KIDNEY.

2390d₁. Section of the Left Kidney containing, and infiltrated by, secondary melanotic deposits, from the same case as Specimen 483a in Series i., where full references will be found. The kidney weighed 25 ounces (652 grms.); the upper two-thirds were surrounded by a mottled pigmented growth, which formed a cap three inches (7.5 cm.), thick and infiltrated the kidney substance. The portion infiltrating the kidney is unpigmented macroscopically. Another unpigmented deposit is found on the lower horn of the renal crescent and a small pigmented one at the upper horn. The suprarenal capsule lay on the top of this cap, and several unpigmented nodules are seen also on the surface of the kidney. (Fixed in formalin and preserved in glycerine.)

For microscopic specimen see *Histological Records*, xxviii. 2390d₁.

2390d₂. Section of the Right Kidney from the same case as the previous specimen. At the lower end of the kidney is a white irregular nodule, and above two unpigmented nodules are seen; on the surface six unpigmented nodules and one larger pigmented nodule, which has been cut in two. The kidney weighed 9 ounces (256 grms.). (Fixed in formalin and preserved in glycerine.)

For microscopic specimen see *Histological Records*, xxviii. 2390d₂.

For references see Series i. No. 483a.

SARCOMA OF KIDNEY.

2391c. Section through a Large Tumour of the Right Kidney, obtained after death from an old woman *æt.* 80 years. The growth is a round-celled sarcoma. There were secondary growths in the liver. Opening of the thorax had not been permitted, and therefore the lungs had not been examined. During life the only symptoms were hæmaturia and progressive weakness. There was no pain, and only slight wasting.

A microscopic section is preserved in the *Histological Records*, xxviii. 2391c.

Presented by M. L. Trechmann, Esq., F.R.C.S.

2391d. Section through a Left Kidney obtained from the body of a man *æt.* 51 years. The kidney shows a large white infiltrating growth, which above also infiltrates the spleen. Behind, the left suprarenal capsule, also infiltrated with growth, can be seen. The right kidney contained numerous rounded nodules of white new growth, and there were also deposits in the myocardium, left pleura, left lung and left sterno-

mastoid muscle. Microscopically the growth is a sarcoma. (Fixed in formalin and preserved in glycerine.)

Clinical Note :—The patient had been well until six months before admission, when he noticed a small lump behind the angle of the left jaw, which grew quickly. This tumour was removed, and the patient died soon after the operation.

See *Histological Records*, xviii. 2391d, where a section of the deposit in the sterno-mastoid muscle has been preserved.

For specimens of cardiac, pleural, and pulmonary deposits, see Series vii. No. 1285c, and Series xi. No. 1678c and No. 1728g.

See *Male Surgical Register*, vol. v. (1897), No. 1445; and *Surgical Post-Mortem Register*, (1897), p. 117.

CARCINOMA OF KIDNEY.

2392e. Section through the Right Kidney with a portion of the Liver attached to it, removed from the body of a woman *æt.* 47 years. The cut surface (which represents the anterior surface of the posterior half of the kidney) shows below the kidney with three large cavities, and above the liver; the intermediate portion being occupied by a growth which also infiltrates the liver. From behind the specimen shows the ureter, held open by a green glass rod, which appears coming through the growth, and is completely blocked up above by a polypoid growth sprouting into its lumen. The vena cava inferior, held open by a blue glass rod, is completely obliterated above, and almost completely filled by a thrombus behind the glass rod. At the lower end of the vena cava is a large gland, and above the ureter a portion of the growth is seen.

Post-Mortem Description :—The right kidney was occupied by a considerable mass of soft new growth as large as an orange, chiefly in the upper half of the kidney. This had extended upwards into the right lobe of the liver for a distance of about 5 cm., but had not reached the upper and outer surface of the liver. The growth had broken down in the centre, and looked like inspissated pus. Here it had been opened by an operation. (This is well shown in the specimen.) The kidney was adherent to all neighbouring parts, especially to the duodenum, liver, and abdominal wall. The inferior vena cava was occupied by a soft whitish breaking down clot. No secondary growths were found in any of the viscera, but the lumbar glands were considerably enlarged and infiltrated with soft white growth. The kidney on section was found to be much dilated and filled with soft pultaceous material, resembling tubercular pus. (This pultaceous material has been cleared out in the specimen, and had occupied the three large cavities.)

Microscopic Examination :—The pultaceous material was examined for tubercle bacilli, but none were found. In some parts the sections of the kidney show nothing but large concentric masses of uncertain nature; in other parts the growth in the kidney is evidently malignant, there being small delicate tubules embedded in a fibrous stroma. The epithelium of the tubules appears to be fusiform and small (? squamous). The lumbar gland showed no tubules, and nothing abnormal beyond a large number of rather big endothelial or epithelioid cells. The growth near the ureter strongly resembles a squamous-celled carcinoma, and contains concentric cell nests. The deposits in the liver are almost identical with those near the ureter, and show many small tubular structures and numerous concentric cell nests. One might believe, therefore, that the disease began in the ureter, and is a form of squamous (tesselated) carcinoma with concentric cell nests.

For histological specimens see *Histological Records*, xxviii. 2392e.

Clinical Note.—Nine months before death the woman complained of slight pain in the region of the right kidney; since then she wasted; there was polyuria for six months. An exploratory incision was made in the right lumbar region (the traces of which are still seen in the specimen in the shape of a groove leading towards the liver), and pus and fatty matter were let out. The condition was then thought to be tubercular. She died soon after.

See *Female Surgical Register*, vol. i. (1896), No. 2822* ; *Surgical Post-Mortem Register*, (1896), p. 4.

SERIES XXIX.

DISEASES AND INJURIES OF THE URINARY BLADDER.

ACUTE CYSTITIS.

2405c. A Bladder removed from the body of a man *æt.* 53 years. Its walls are acutely inflamed and hæmorrhagic, presenting the appearances typical of cystitis. There was a stricture of the urethra and extravasation of urine, and consecutive acute suppurative nephritis. (Fixed in formalin and preserved in glycerine.)

The kidney has been preserved in Series xxviii. No. 2338d.

See *Male Surgical Register*, vol. i. (1897), No. 1887; and *Surgical Post-Mortem Register*, (1897), p. 157.

PAPILLOMA OF BLADDER.

2418b. A Bladder obtained from the body of a man *æt.* 47 years. On the left side, at the base of the bladder, there is a red papillomatous growth fixed to the mucosa by a narrow and long pedicle. There were no symptoms during life pointing to the presence of a villous growth except slight hæmaturia, and the patient was under treatment for cardiac disease. (Fixed in formalin and preserved in glycerine.)

See *Histological Records*, xxix. 2418b.

See *Medical Post-Mortem Register*, vol. xxiv. (1897), p. 119; and *Male Medical Register*, vol. i. (1897), No. 100.

MELANOTIC SARCOMA OF BLADDER.

2419a. A Bladder opened from the front, showing on its inner surface a small black nodule on the left-hand side. The specimen was obtained from a case of multiple melanotic sarcoma, from which also Specimen 483a in Series i. was removed.

For references and other specimens of the same case see Series i. No. 483a.

SERIES XXX.

DISEASES AND INJURIES OF THE BRAIN AND
ITS MEMBRANES.**SUPPURATIVE MENINGITIS.**

2453a. The Brain of a boy *æt.* 12 years, who died with suppurative otitis media (right side) and suppurative meningitis. The medulla, pons, and crura, with neighbouring parts of cerebellum and brain, are coated with purulent exudation. At the post-mortem examination there was extensive suppurative disease of the right middle ear, no perforation of the roof and posterior wall of the tympanum; the dura mater over the upper surface of the right petrous bone, and over the posterior surface external to the internal auditory meatus, was healthy and not adherent to the brain, but internal to the meatus it was coated with exudation which extended over the above-mentioned region. The vessels of the pia mater are greatly injected. (Fixed in formalin and preserved in glycerine.)

See *Male Surgical Register*, vol. iv. (1897), No. 1894; and *Surgical Post-Mortem Register*, (1897), p. 163.

SARCOMA.

2465d. A Tumour, histologically a spindle-celled sarcoma, removed by operation from a man *æt.* 43 years. For three years he had complained of attacks of formication in the right leg, unaccompanied by any motor symptoms; during the last six months he suffered from general convulsions, which always began in the right leg, but there was neither vomiting nor headache. He was trephined over the leg centres on the left side, and an ovoid lobulated encapsuled tumour was removed from the cortex of the brain, where it lay under the dura and pia mater in a hollow from which it could be easily shelled out. The operation was followed by much collapse and marked paralysis of the right arm. Five months later he was readmitted on account of a recurrence of the fits. He was again trephined, but there was apparently no recurrence. (Fixed in formalin and preserved in glycerine.)

For histological specimen see the *Histological Records*, xxx. 2465d.

See *Male Surgical Register*, vol. iv. (1896), No. 3108.

TEMPORO-SPHENOIDAL ABSCESS.

2486e. Right Hemisphere of the Brain of a woman *æt.* 21 years. It shows a large abscess cavity in the temporo-sphenoidal lobe, which had appeared as a sequela of otitis media. There was localised meningitis over the roof of the tympanic cavity, and here the dura mater was grey and sloughing, and there was a small opening connecting the middle ear with the abscess in the temporo-sphenoidal lobe. This lobe was much swollen and its convolutions were much flattened. The lateral sinus was sound and normal. (Fixed in formalin and preserved in glycerine.)

See *Female Surgical Register*, vol. iii. (1896), No. 2290; and *Surgical Post-Mortem Register*, (1896), p. 224.

ABSCCESS OF CEREBELLUM.

2486g. The specimen was obtained from the body of a woman *æt.* 26 years. In the right lobe of the cerebellum there is an abscess nearly 1 inch (2.5 cm.), in diameter, which at the time of the autopsy contained about half an ounce (14 grms.) of greenish fetid pus and had originated in the posterior peduncle. Only a thin layer of brain matter separates the abscess cavity from the floor of the fourth ventricle, which was flattened and bulged upwards. From the main abscess pus had made its way forwards through a small opening to the superficial part of the middle peduncle of the cerebellum. (A glass rod has been inserted through this opening.) The middle peduncle was eroded to the depth of a quarter of an inch (.6 cm.) over an area of an inch (2.5 cm.) in diameter. The superficial origin of the facial and auditory nerves were so involved in this abscess that they were indistinguishable.

The ventricular cavities contained a slight excess of turbid serum, but there was no disease of any other part of the brain, inside or outside. The cavities of the right internal and middle ear were natural.

Clinical Note.—Four years before, the patient suffered from pyæmia following upon necrosis of the tibia, for which amputation was performed. For three weeks before admission she had headache, and the face was drawn to the left a week later. On admission, the face was drawn to the left, the right eye could be only partially closed; there was weakness of the right rectus externus, marked nystagmus, but good vision and sensation; deafness of the right ear and difficulty of deglutition, drowsiness and paralysis of the right masseter and protrusion of the tongue to the right. A few days later she became comatose and died.

See *Female Surgical Register*, vol. i. (1895), No. 892; and *Surgical Post-Mortem Register*, (1895), p. 107.

CEREBRAL ABSCESS.

2486h. Coronal Section of a Brain obtained from the body of a woman *æt.* 26 years. In the left parietal lobe is a large abscess, causing distinct bulging on this side. The abscess appeared in consequence of a fracture produced by a violent blow on the head.

Four days after admission there was pyrexia, and though the scalp wound healed well, the temperature remained high, and a month after the injury the woman was drowsy and the pyrexia marked. Paralysis of the right arm appeared and also aphasia, and paresis of right side of face. She was then trephined, and pus was found in the diploe and between the bone and dura mater. Later, convulsions occurred, unconsciousness and drowsiness followed, rigidity of right arm, stertorous breathing, and on the seventh day after the trephining she died, the abscess not having been detected.

See *Female Surgical Register*, vol. iv. (1896), No. 24; and *Surgical Post-Mortem Register*, (1896), p. 22.

2523a₁. Right Hemisphere of the Brain of a man *æt.* 29 years, who died from the injuries sustained by falling while in a state of intoxication into an area five feet deep, alighting on his head. He lived three days after the accident. The day after the accident he was trephined over the right side of the skull; a linear fracture and a large amount of clot were found.

The bleeding point was not found ; plugging was attempted, but he gradually sank, the temperature steadily rising to 103.8° F.

There is superficial laceration of the under surface of the right frontal lobe, and the right temporo-sphenoidal lobe is deeply lacerated and infiltrated with blood. The hæmorrhage extends upwards along the Rolandic fissure, and there is also a collection of blood in the parietal lobe at the termination of the horizontal limb of the Sylvian fissure.

The base was not fractured, but only a linear fracture over the back of the skull, extending across the occipital bone to the left petrous bone. (Fixed in formalin and preserved in glycerine.)

See *Male Surgical Register*, vol. v. (1896), No. 3767 ; and *Surgical Post-Mortem Register*, (1896), p. 283.

SERIES XXXIII.

DISEASES AND INJURIES OF THE EYE AND ITS APPENDAGES.

XEROSIS.

2579e. Section through the Left Eye of a woman æt. 25 years. The cornea is thick and opaque, and illustrates the condition known as xerosis.

Report before Excision.—Left cornea was found to be dry and scaly and semi-opaque ; the upper eyelid small and retracted, so that it could not cover more than a small portion of the upper half of the cornea.

History.—Patient has been blind with left eye ever since she can remember ; has had several operations to form an upper lid, so as to cover the eye.

From *Ophthalmic Ward Book*, (1897), No. 1305.

2593d. Coronal Section through the Left Eye of a girl æt. 17 years, which had been injured two months before the excision. The lens is partly dislocated and fixed by inflammatory (hæmorrhagic) adhesions to the iris.

Report before Excision.—Cornea injected, scar in lower part of cornea and pupil drawn down by anterior synechiæ ; anterior chamber very shallow and a white opaque mass seen below and behind pupil.

History.—Two months before excision the patient was chopping wood and a piece struck her left eye. An iridectomy was performed before her admission to this Hospital.

See *Ophthalmic Ward Book*, (1896), No. 3832.

MELANOTIC SARCOMA.

2606a. Section through the Right Eye of a man æt. 63 years, which is completely occupied by a growth which microscopically is a melanotic sarcoma. The growth is more or less embedded in the vitreous humour.

History.—Dimness of vision two and a half years before excision ; nasal field of vision was lost first, and in two months the eye became quite blind ; there was a history of a blow fourteen years ago.

Report before Excision:—Cornea clear, anterior chamber absent, iris being in contact with posterior surface of cornea; pupil blocked by a white opacity; tension diminished; vision: barely perception of light.

A microscopic specimen will be found in the *Histological Records*, xxxiii. 2606a.
See *Ophthalmic Ward Book*, (1897), No. 519.

GLAUCOMA.

2608d. Section through the Left Eye removed from a man *æt.* 74 years. The lens is opaque, the anterior chamber diminished in size by the lens being considerably pushed forwards. The disc is slightly cupped, and clinically the symptoms were those of chronic glaucoma.

See *Ophthalmic Ward Book*, (1896), No. 2792.

2608e. Horizontal Section through the Left Eye, excised from a woman *æt.* 19 years. The anterior chamber is deep, the cornea hazy, the iris discoloured, the lens almost completely atrophied, the choroid coat detached and atrophied, and the disc cupped.

Report before Excision:—Cornea hazy, anterior chamber very deep and aqueous humour turbid, pupil small and irregular, and bound down by adhesions; lens quite opaque and shrivelled; optic disc very white, choroid atrophied, retina not detached.

History:—When 16 years old patient complained of pain and photophobia in left eye, which gradually increased; multiple scars about body when very young; scars at angles of mouth; central incisors notched; right eye appears natural.

See *Ophthalmic Ward Book*, (1897), No. 501.

TUBERCLE OF CHOROID COAT.

2621d. The Posterior Half of an Eye of a girl *æt.* 5 years, who died with general tuberculosis (tubercular meningitis, tuberculosis of lungs, liver, spleen, &c.). The eye has been everted, and shows numerous miliary tubercles; the choroid pigment has been brushed away.

See *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 339; and *Female Medical Register*, vol. v. (1896), No. 152.

DETACHED RETINA.

2654a. Antero-posterior (horizontal) Section through the Left Eye, removed from a boy *æt.* 8 years. The anterior third of the eye is slightly bulged forwards, the anterior chamber is obliterated, and the iris adherent to the posterior surface of the cornea, which is opaque over the pupil and vascularised at the periphery. The lens is absent, the retina completely detached and attached to the iris anteriorly; the vitreous humour is replaced by a semi-solid greenish substance.

There was no history of an injury.

See *Ophthalmic Ward Book*, (1896). No. 2469.

SERIES XXXIV.

DISEASES OF THE EAR.

OTITIS MEDIA.

2676f. Section through the Right Petrous Bone, removed from the body of a boy æt. 18 years. It shows (1) a small polypus growing from the membrana tympani; (2) a perforation in the upper part of the membrane, through which a bristle has been passed; (3) destruction of the ossicles; (4) the attic has been enormously enlarged by caries, and (5) the roof of the tympanum has also been destroyed by caries. At the time of the autopsy the meatus was completely filled with thick pus; there was also extensive meningitis on the right side, and subdural suppuration.

See *Surgical Post-Mortem Register*, (1895), p. 223.

SERIES XXXVI.

DISEASES OF THE TESTICLE, ITS COVERINGS,
AND OF THE SPERMATIC CORD.

INFANTILE HYDROCELE.

2735a. Hydrocele of the Tunica Vaginalis with Testis, removed from the body of a hæmophilic man æt. 54 years, who died from hæmorrhage after excision of the tongue for carcinoma. The funicular portion of the tunica vaginalis is only partially obliterated, and the fluid had extended some distance along the unobliterated funicular portion.

See *Surgical Post-Mortem Register*, (1894), p. 189.

MELANOTIC SARCOMA OF TESTIS.

2797p. The Left Testis cut in two, showing a deep black circumscribed nodule of melanotic sarcoma, obtained from the same case as Specimen 483a in Series i. In the epididymis there are two small pigmented nodules.

For microscopic specimen see *Histological Records*, xxxvi. 2797p.

For references see Series i. No. 483a.

ENCYSTED HYDROCELE.

2806a. Half of the Right Testis, which, together with the opposite testis, had been removed to relieve the troubles caused by an enlarged prostate. The whole of the epididymis is converted into a loculated cyst (encysted hydrocele), and the cystic condition extends into the rete testis.

The patient, a man aged 65 years, had been admitted with incontinence of urine, due to an enlarged prostate. Hæmaturia set in, and catheterisation became

very painful; therefore, as the patient was declining, castration was performed. Both epididymes contained an encysted hydrocele. One of the cysts was cut into, and the microscope showed that the escaping fluid contained spermatozoa in small numbers.

Presented by R. C. Bailey, Esq., F.R.C.S.

SERIES XXXIX.

DISEASES OF THE PROSTATE GLAND.

SARCOMA OF PROSTATE GLAND.

2854a₁. Section through a Large Tumour of the Prostate Gland, obtained after death from a man *æt.* 57 years. It shows several calcareous nodules in its lower part.

Microscopically it proved to be a fibro-sarcoma.

See *Histological Records*, xxxix. 2854a¹.

See *Male Surgical Register*, vol. iv. (1895), No. 1475; and *Transactions of the Clinical Society*, vol. xxx. (1897).

SERIES XL.

DISEASES AND INJURIES OF THE URETHRA AND PENIS.

VILLOUS GROWTH IN URETHRA.

2883a. Bladder and Prostate of a man *æt.* 86 years, showing two villous growths: (a) A small pedunculated papillomatous growth springing from the left wall of the prostatic urethra, half an inch from the trigonum vesicæ. The tip of the growth was directed upwards and lay in the bladder. (b) Lower down, attached to the left of the verumontanum and below the uterus masculinus, there is a sessile villous papilloma, one third of an inch (.8 cm.) in diameter. The prostate is moderately enlarged and the bladder slightly dilated.

See *Surgical Post-Mortem Register*, (1895), p. 243; and *Male Surgical Register*, vol. iv. (1895), No. 2932.

SERIES XLI.

DISEASES OF THE OVARIES.

OVARIAN CYST.

2904b. Portion of a Multilocular Ovarian Cyst, removed by operation from a woman *æt.* 55 years. The cyst grew in connection with the left ovary. (Fixed in formalin and preserved in glycerine).

See *Female Surgical Register*, vol. iv. (1896), No. 2063.

PAPILLOMATOUS CYST.

2913c. The two Growths were removed by operation from a woman \ae t. 28 years. They are extremely papillomatous, the papillary masses having grown around the ovaries, which are more or less embedded in them. The ovaries, though not much enlarged, are cystic, the cysts containing papillary excrescences. It must be assumed that the intracystic growths forced their way through the cyst wall and then sprouted rapidly. At the post-mortem examination the peritoneum was found to be in a condition of general inflammation, but no metastatic deposits were discovered either in the peritoneum or elsewhere.

Microscopically the papillary growths are built up of pure myxomatous tissue lined by columnar epithelium, but no evidence of carcinoma was obtained.

See *Histological Records*, xli. 2913c.

See *Surgical Post-Mortem Register*, (1895), p. 301; and *Female Surgical Register*, vol. ii. (1895), No. 2694.

2913d. An Ovarian Cyst removed by operation from a woman \ae t. 29 years. The specimen shows an empty cyst and below it a large mucoid papillomatous growth to which another cyst (unopened) is attached. The growth had involved the right ovary, and it appears that either the papillomatous growth had once filled the empty cyst, which had burst and then become everted, or that a papillomatous growth sprouted through the cyst wall and then rapidly grew to its present size. At the time of the operation no secondary deposits were detected in the peritoneal cavity. It is asserted that the opening into the cyst was natural and not made during or after the operation. (Fixed in formalin and preserved in glycerine.)

Clinical History:—An enlargement of the abdomen was noticed $2\frac{1}{2}$ years before the final removal of the growth, and the woman was treated for dropsy. A year later the abdomen was opened and free fluid found, and a growth which could not be removed. Four months later a second operation was performed and a large amount of free fluid let out, but the growth, which was supposed to be a malignant papilloma, was not removed. Eight months later the abdomen and legs swelled and the patient was losing flesh. The abdomen was tapped, and three months later the growth was eventually removed, since when she has done well.

Microscopically the growth is apparently an innocent papilloma lined by actively secreting columnar cells, and the follicles are filled with mucus.

See *Histological Records*, xli. 2913d.

Presented by C. H. Roberts, M.D.

PAROVARIAN CYST.

2923. A Parovarian Cyst obtained by operation from a woman \ae t. 38 years. The right ovary is seen in section on the right side, and the cyst, which has been bisected, is quite distinct from the ovary, the tube running across its broad ligament capsule. The latter can be well seen on holding the specimen up to the light.

Presented by C. H. Roberts, M.D.

2923c. A Small Parovarian Cyst, about $2\frac{1}{4}$ inches long and 2 inches broad (5.6×5 cm.), removed by operation from a woman *æt.* 52 years, who also had carcinoma of the cervix uteri and fibroids. A window has been cut in the posterior wall of the cyst, and the anterior wall is studded with small hard growths.

Presented by Harrison Cripps, Esq., F.R.C.S.

CALCIFYING FIBROMA OF OVARY.

2925c. The Tumour was obtained by operation from a lady *æt.* 29 years (who had borne no children). It is irregularly ovoid in shape and very hard, its surface somewhat uneven, and it evidently had grown from the ovary. The cut surface shows that the tumour is a calcifying fibroma, there being irregular calcareous plates and spicules. Dermoid structures are absent. The growth weighed $6\frac{1}{4}$ ounces (177 grms.).

Histologically the growth was purely fibromatous and not dermoid, showing in addition calcareous deposits. At the time of operation there was no hydroperitoneum.

A microscopical section has been preserved in the *Histological Records*, xli. 2925c.

See *Transactions of the Obstetrical Society*, vol. xxxix. (1897).

Presented by C. H. Roberts, M.D.

SERIES XLII.

DISEASES OF THE UTERINE APPENDAGES.

PRIMARY CARCINOMA OF FALLOPIAN TUBE.

2938g. The specimen, obtained by operation from a woman *æt.* 43 years, shows a malignant growth which had sprung from the wall of the right Fallopian tube. The latter has been laid open, and is seen to be filled by a papillomatous growth, which microscopically proved to be a columnar-celled carcinoma. The specimen is an instance of primary carcinoma of the Fallopian tube.

See *Histological Records*, xlii. 2938g.

Presented by C. H. Roberts, M.D.

SERIES XLIII.

DISEASES OF THE UTERUS.

CYSTIC FIBROMA.

2992a. Specimen of a Cystic Fibroma Uteri, removed by operation from a woman *æt.* 40 years. The tumour was cystic, measuring about 8 in. by 9 in. by 6 in. ($20 \times 22.5 \times 15$ cm.). There were many cysts, and one of them was "gangrenous."

See *Female Surgical Register*, vol. iv. (1896), No. 356.

SERIES XLIV.

DISEASES OF THE VAGINA AND EXTERNAL
ORGANS OF GENERATION IN THE FEMALE.

EPITHELIOMA OF VAGINA.

3031a. Section through an Epithelioma which had developed in the posterior wall of the vagina in a single woman æt. 38 years, and was removed by operation. There was a history of a blood-stained discharge of six months' duration. The growth, on examination, was as large as a half-crown piece, and was situated in the middle of the posterior wall, ulcerated, and bled on being touched.

The specimen on its cut surface shows the epitheliomatous infiltration extremely well; the growth is warty and ulcerated. (Fixed in formalin and preserved in glycerine.)

A microscopical section is preserved in the *Histological Records*, xliiv. 3031a.

See *Transactions of the Obstetrical Society*, vol. xxxix. (1897).

Presented by C. H. Roberts, M.D.

LABIAL CYST.

3035c. A Cyst removed by operation from the right labium majus of a woman æt. 40 years, which contained thick, granular, purulent material. The cyst had gradually developed during four to five years.

See *Martha Ward Notes*, (1894), No. 199.

SERIES XLVI.

DISEASES AND INJURIES INCIDENTAL TO
GESTATION AND PARTURITION.

TUBAL GESTATION AND BROAD LIGAMENT CYST.

3077d. The specimen, which was obtained by operation from a woman æt. 41 years, shows a broad ligament cyst. At the operation this cyst was found on the right side of the body; it contained clear fluid, and the Fallopian tube was seen to run over and along its wall unruptured, but with an enlargement of the size of a filbert. On opening this tubal enlargement, which could be seen from the inside of the cyst, a mass of chorionic villi was found. A little blood must have escaped from time to time from the open end of the tube, and apparently where it had trickled there were some adhesions. Most of these points are readily seen in the specimen, which is evidently an extra-uterine gestation complicated by a broad ligament cyst.

On the left side there was a broad ligament cyst of the size of a plover's egg, over which ran the tube unenlarged.

Clinical Note :—Patient was a woman *æt.* 41 years, who had been pregnant six times, having had two miscarriages and four children, the last pregnancy having been three years before (full time). She was quite well till March 1897, then menstruated at the right time, and this was followed by irregular hæmorrhage for ten days. Breasts were enlarged and tender between the March and April periods, and were usually so when she was pregnant. Bleeding returned about the end of April 1897 and lasted three weeks, being slight before its cessation. Since then she had irregular losses, but never profuse ones. There had been severe pain on the right side of the pelvis after the March period, and again for a few days previous to May 18th, when she was seen. At that time there were no signs of activity in the breasts, the abdomen was tender, especially in the right iliac fossa, the cervix was displaced to the left and soft, the uterus did not feel enlarged and was not fixed. In the right posterior quarter of the pelvis, low down, was a somewhat elastic, very tender, fixed body, of the size of a hen's egg. A week later pain was present almost daily, and the mass had assumed the size of a large orange, extending behind the cervix and pushing the uterus forward.

Presented by F. H. Champneys, M.D.

FIBRO-MYOMA OF PREGNANT UTERUS.

- 3090a. Section through a Uterus and Fibroid Tumour growing from one side of the uterus of a woman *æt.* 44 years, successfully removed by operation. The uterus contains a foetus (about four and a half months old), and at its lower and posterior aspect another large fibroid tumour is seen.

The case has been fully described in the *Transactions of the Obstetrical Society* (London), vol. xxxix. (1897).

See *Female Medical Register*, vol. vi. (1896), Part i. No. 31.

SERIES XLVIII.

DISEASES OF THE MAMMARY GLAND.

CARCINOMA OF BREAST.

- 3172b. Section of a Carcinomatous Breast with Axillary Glands, removed by operation from a woman *æt.* 32 years. Microscopically the growth is a "scirrhous." The nodules of growth are well shown, infiltrating and occupying the whole breast and the lymphatic glands. Under the skin near and around the nipple there are also numerous nodules. (Fixed in formalin and preserved in glycerine.)

A microscopical specimen has been preserved in the *Histological Records*, xlviij. 3172b.

See *Female Surgical Register*, vol. v. (1897), No. 1084.

ULCERATING CARCINOMA OF BREAST.

- 3176a. Section through a Breast removed by operation from a woman *æt.* 58 years. The breast is occupied by a hard scirrhous carcinoma, and its surface is extensively destroyed by ulceration. The growth is

seen to infiltrate the pectoralis major. Microscopically the growth was a "scirrhous." (Fixed in formalin and preserved in glycerine.)

A microscopical section is preserved in the *Histological Records*, xlvi. 3176a. See *Female Surgical Register*, vol. iii. (1896), No. 2598.

FUNGATING CARCINOMA.

3179b. Section through a Breast removed by operation from a woman æt. 55 years. The white carcinomatous growth is well seen lying in yellow fat, and had fungated through the skin just above the nipple, which is seen in section just below the fungating mass. The woman also suffered from myxœdema. The mammary growth was a scirrhous carcinoma. (Fixed in formalin and preserved in glycerine.)

A microscopical section is preserved in the *Histological Records*, xlvi. 3179b. See *Female Surgical Register*, vol. iii. (1897), No. 2846*.

SERIES L.

GENERAL PATHOLOGY

PHAGEDÆNIC ULCERATION OF CHEST.

3233h. Portion of the Right Half of the Thorax of a child æt. 3 months, showing a considerable ulcer, completely exposing a number of ribs. Two weeks before admission there was a swelling in the right axilla, which burst and discharged. Sloughing took place, so that on admission there was a large ulcerating area over the right side of the chest. The whole of the skin covering the axilla has disappeared, exposing the contents of the axilla freely, and the third, fourth, fifth, and sixth ribs are bared. The infant showed signs of congenital syphilis, and post-mortem examination also revealed septic meningitis.

See *Male Surgical Register*, vol. ii. (1895), No. 438; and *Surgical Post-Mortem Register*, (1895), p. 45.

VARICELLA GANGRENOSA.

3233l. The Right Hand of an infant æt. 10 months, showing severe necrotic ulceration resulting from varicella gangrenosa. Both hands were affected, and there were necrotic ulcers on the head, both arms and legs, and front of trunk. The left foot has been preserved (see No. 3233m).

See *Surgical Post-Mortem Register*, (1897), p. 38; and *Female Surgical Register*, vol. v. (1897), No. 510.

3233m. The Left Foot of the same infant from whom the above specimen was obtained.

For references see previous specimen.

GANGRENE.

3235k. Portion of the Right Foot of a young woman æt. 22 years, amputated by a modified Chopart's operation. It is a typical specimen of dry gangrene. The woman was admitted with symptoms which pointed to enteric fever, and this diagnosis was subsequently confirmed by the further clinical course of the disease and the serum test (Widal-Grünbaum). A few days after admission gangrenous discoloured patches appeared on both feet, apparently due to arterial thrombosis. The gangrene gradually extended, a good line of demarcation appeared, and subsequently both feet were amputated. Clinically the case was one of great interest. (Fixed in formalin and preserved in glycerine.)

See *Female Surgical Register*, vol. ii. (1897), No. 2679*.

FROST-BITE.

3236a. A Finger removed by operation from a man æt. 61 years (an organ-grinder). Seven years ago the patient had been exposed to much cold; the finger became gangrenous, and has been ulcerated since. The terminal phalanx is almost completely destroyed, and the skin on the dorsal side of the finger is ulcerated.

See *Male Surgical Register*, vol. iii. (1897), No. 1337.

FAT NECROSIS.

3238m. The specimen shows a small portion of the Stomach with the adjoining part of the great Omentum. In the omental fat there are numerous opaque, yellowish (? bile-stained) spots, due to fat necrosis occurring after a rupture of the pancreas caused by a crush. (Fixed in formalin and preserved in glycerine.)

For a description of the pancreas and the history of the case see Series xxiii. No. 2276d.

See *Male Surgical Register*, vol. v. (1896), No. 3626; and *Surgical Post-Mortem Register*, (1896), p. 226.

FIBROMA AND CHRONIC ULCER OF LEG.

3269a. Section through a Fibrous Tumour which grew on the leg of a man æt. 46 years, in connection with a chronic ulcer of ten years' duration. The growth is attached at the inner side of the right leg, and is smooth on its surface, of hard consistence, and around it is unhealthy nodular granulation tissue. Four years before removal, a small growth appeared in the centre of the ulcer, which gradually increased in size. Microscopically the growth is a fibroma.

See *Histological Records*, l. 3269a.

See *Male Surgical Register*, vol. iii. (1897), No. 1449.

PENDULOUS FIBROMA.

3280b. Section through a Pendulous Fibroma. The fibroma was attached at the right natis, $2\frac{1}{2}$ inches (6.25 cm.) above the anus and $1\frac{1}{2}$ inches (3.75 cm.) from the vulva, and was successfully removed by operation

from a woman æt. 45 years. It was first noticed eight years before as a small flat raised lump, which gradually increased in size and became pendulous. The growth is very vascular, and microscopically is a soft fibroma. (Fixed in formalin and preserved in glycerine.)

See *Histological Records*, 1. No. 328ob.

Presented by H. Ellis, Esq.

MELANOTIC SARCOMA.

3316a. Section through a Fungating Melanotic Sarcoma, which was removed from a man æt. 40 years. The growth covered and involved the left breast, moving freely over the deeper structures, and was fungating rapidly, bleeding profusely on touching it. There were enlarged glands in both axillæ, and in the left supra-clavicular region.

For histological specimen see *Histological Records*, 1. 3316a.

See *Male Surgical Register*, vol. v. (1896), No. 1194.

MELANOTIC SARCOMA OF SKIN.

3316b. A Nodule of Melanotic Sarcoma in the Skin, obtained from the same case as Specimen 483a in Series i. (Fixed in formalin and preserved in glycerine.)

For references see Series i. No. 483a.

ENDOTHELIOMA.

3318k. A Growth removed from the chest wall of a girl æt. 13 years, just below the left clavicle. Microscopically the nature of the growth was doubtful, being described by some as sarcoma, by others as epithelioma, and by others again as an innocent connective tissue or endothelial growth. (Fixed in formalin and preserved in glycerine.)

Four years ago a lump appeared under the clavicle, which fourteen months ago began to discharge, and was removed two months later. It recurred, and was removed again, on suspicion that it was a sarcoma.

See *Histological Records*, 1. 3318k.

See *Female Surgical Register*, vol. iv. (1897), No. 204.

BRANCHIAL FISTULA.

3371f. The specimen represents a Duct-like Tube, which was removed by operation from the neck of a boy æt. 15 years, who had a discharging sinus on the right side of the neck since birth. The opening of this fistula was situated over the anterior border of the sterno-mastoid at the level of the lower border of the cricoid cartilage. A probe could be passed through the fistula for $2\frac{1}{2}$ inches (6.25 cm.), and a thin purulent fluid oozed out from the opening. The "duct" passed up towards the posterior pillars of the pharynx, but there was no internal opening. When dissected out, it measured 4 inches (10 cm.) in length. Microscopically the "duct" was found to be lined by columnar ciliated epithelium.

See *Histological Records*, 1. 3371f.

See *Male Surgical Register* vol. v. (1897), No. 294.

EMPHYSEMATOUS OVARIAN CYST.

3382k. A Section of a large Ovarian Cyst, removed after death from the body of a woman *æ*t. 27 years. The cyst is riddled with cavities which contained air, which caused the cyst to float in water, so that there was an emphysematous condition. The cavities contained mucous viscid fluid and gas, and from the fluid the *B. aerogenes capsulatus* of Welch and Nuttall was separated by cultivation.

History:—When the patient, an unmarried woman, was first seen, she complained of severe abdominal pain and vomiting, which had come on acutely. On examination, the abdomen was greatly swollen and tender, and felt like a full term pregnancy, but pregnancy was excluded. She had suffered from anæmia and menstruation had been irregular.

Post-Mortem Examination one day after death revealed advanced decomposition and blood-stained fluid in the peritoneal cavity, and a large ovarian tumour occupying the whole of the front of the abdomen, springing from the left side, and full of cysts. It was believed that one of these had ruptured.

Microscopically the emphysematous condition of the tumour is well seen; the smaller air spaces were free from fluid, the larger ones contained both fluid and air. There are numerous bacilli present, which stain by Gram-Weigert's method.

See *Histological Records*, 1. 3382k.

Presented by J. H. Gilbertson, Esq.

SERIES LII.
URINARY CALCULI.**VESICAL CALCULI.**

219c. A Collection of Spherical Calculi (weighing $1\frac{1}{2}$ grammes) washed out of the bladder of a woman *æ*t. 26 years, who was admitted for prolapsus uteri. During the plastic operation the bladder was washed out, because the patient had complained of passing small stones. Chemical examination proved absence of uric acid and presence of calcium carbonate, and chiefly calcium phosphate.

See *Female Medical Register*, vol. vi. (1897), No. 43.

INTESTINAL CALCULI.**FÆCAL CONCRETION.**

282b. One half of a hard Globular Mass, measuring $2\frac{1}{4}$ inches (5.62 cm.) in diameter, removed by operation from the rectum of a woman *æ*t. 60 years. The mass is evidently fæcal in origin, being built up by a series of concentric layers of hardened fæces deposited on a central solid core of the same material.

The patient complained of a constant desire to go to stool and passage of blood-stained mucus, and was thought to be suffering from cancer. The posterior wall of the rectum was divided and the concretion removed entire. The patient made a good recovery.

Presented by Harrison Cripps, Esq., F.R.C.S.

SERIES LVI.

CASTS AND MODELS OF DISEASED OR
INJURED PARTS.

CHARCOT'S DISEASE.

20r₁. Cast of the Right Foot of a man æt. 36 years, with marked swelling about the ankle, due to Charcot's disease.

See *Male Surgical Register*, vol. iv. (1897), No. 1631.

DEPRESSED FRACTURE.

24b. Cast of the Back of the Head of a male infant æt. 4 months, showing a small round depression, the result of a fall.

See *Male Surgical Register*, vol. v. (1896), No. 3024.

POTT'S FRACTURE.

33f. Cast of the Right Foot of a girl æt. 14 years, in a condition of partial talipes varus, following a Pott's fracture, which had occurred four years previously. The external malleolus is exceedingly prominent. The next cast shows the improvement resulting from an operation in which a wedge-shaped piece of bone was removed from the fibula 2 inches above the external malleolus.

See *Female Surgical Register*, vol. i. (1896), No. 2275.

33g. Cast of the same Foot taken one month after the operation.

SUBASTRAGALOID DISLOCATION.

56b. Cast of the Right Foot of a woman æt. 65 years, showing a subastragaloid dislocation, with dislocation of the astragalus, the result of a fall which occurred nineteen weeks previously.

The foot was subsequently amputated, as reduction was found to be impracticable.

See *Female Surgical Register*, vol. iv. (1896), No. 2215.

COMPOUND DISLOCATION.

56c. Cast of the Left Foot of a man æt. 48 years, showing a compound dislocation of the foot inwards. The lower articular ends of the tibia and fibula are seen projecting through a long rent in the skin covering the ankle. The injury was caused by a fall off a ladder; the man also sustained a severe fracture of the pelvis and fracture of the sternum and right os calcis. He died shortly afterwards.

See *Male Surgical Register*, vol. ii. (1897), No. 1771.

FLAT FOOT.

90a₂. Cast of the Left Foot of a man æt. 32 years, showing well-marked flat foot.

See *Male Surgical Register*, vol. i. (1897), No. 334.

SERIES LVII.

DRAWINGS AND PHOTOGRAPHS OF DISEASED OR
INJURED PARTS.**PULMONARY OSTEO-ARTHROPATHY.**

- 4g. A Series of fourteen Photographs, illustrating the appearances, and bony as well as articular changes in Pulmonary Osteo-Arthropathy.

See *Transactions of Pathological Society, London*, vol. xlviii. (1897).

Presented by F. H. Westmacott, Esq., F.R.C.S.

UNUNITED FRACTURE.

- 110a. Two Photographs of an Ununited Fracture of the Tibia, from a man *æt.* 24 years.

See *Male Surgical Register*, vol. iii. (1896), No. 2820.

ANEURYSM OF AORTA.

- 185a. Drawing of an Aneurysm of the Arch of the Aorta containing a laminated blood clot, from a man *æt.* 50 years. (L. Mark.)

See *Surgical Post-Mortem Register*, (1896), p. 229.

VARICOSE VEINS.

- 203b. A Drawing showing Tortuous and Dilated Veins running along the right side of the trunk of a man *æt.* 35 years. The condition resulted from obstruction of the vena cava superior. A drawing showing a calcareous ring in the vena cava superior is preserved in this Series, No. 204b. (L. Mark.)

See *Male Medical Register*, vol. iii. (1896), p. 129; *Medical Post-Mortem Register*, vol. xxiii. (1896), p. 292; and *St. Bartholomew's Hospital Reports*, vol. xxxii. (1896), p. 71.

OBSTRUCTION OF VENA CAVA SUPERIOR.

- 204b. A Drawing showing a Funnel-shaped Calcareous Ring in the vena cava superior at the junction of the right and left innominate veins. The lumen of the vein is greatly narrowed. The superficial veins of the trunk were tortuous and dilated, and a drawing of these has been preserved in this Series, No. 203b, where full references will be found. (L. Mark.)

CHANCRE OF TONGUE.

- 308a. A Drawing of the Tongue of a sailor *æt.* 47 years, showing a primary syphilitic sore. (L. Mark.)

LYMPHANGIOMA OF TONGUE.

- 321b. Drawing of a Lymphangioma on the tip of the tongue of a child *æt.* 1 year, which had been noticed for six months. (L. Mark.)

From the Out-Patient Department.

PROLAPSE OF RECTUM.

458. A Drawing showing Prolapse of Rectum and a Hydrocele in a man æt. 65 years. (L. Mark.)

See *Male Surgical Register*, vol. iv. (1897), No. 572.

GOITRE.

- 533c. Two Photographs showing a Unilateral Goitre, causing much displacement of the trachea and larynx, from a man æt. 45 years.

See *Male Surgical Register*, vol. v. (1896), No. 3437.

- 902a. A Photograph showing a bullous eruption on the hands. In the vesicular contents the *Streptococcus pyogenes* was found.

From the Skin Department (Out-Patient).

ERYTHEMA IRIS.

- 924b. Drawing of an infant æt. 3 weeks, showing a curious eruption on the head (erythema iris). (L. Mark.)

From the Skin Department.

CARCINOMA OF FALLOPIAN TUBE.

971. A Drawing of the Uterus and Fallopian Tubes, showing primary carcinoma of the Fallopian tubes, invading also the right and left ovaries.

See *Transactions of the Obstetrical Society, London*, vol. xxxviii. (1896); and Albutt and Playfair: *A System of Gynæcology*, p. 812 (footnote).

Presented by Alban Doran, Esq.

ERYSIPELAS OF EYELIDS.

- 1067a. A Drawing showing Erysipelas of the Eyelids in a girl. (L. Mark.)

From the Out-Patient Department.

RAYNAUD'S DISEASE.

- 1102b. Drawing of the Feet of a woman æt. 45 years, affected with Raynaud's disease. (L. Mark.)

See *Female Medical Register*, vol. i. (1897), No. 28.

NÆVUS.

1208. A Drawing showing two Nævi on the chest wall, from a female infant æt. 7 months. (L. Mark.)

See *Female Surgical Register*, vol. ii. (1897), No. 7.

CONGENITAL DEFORMITY OF URETHRA (HYPOSPADIAS).

- 1315m. A Drawing of the Penis and Scrotum of a man æt. 22 years, showing a congenital fistulous opening into the urethra. (L. Mark.)

See *Male Surgical Register*, vol. iii. (1897), No. 280.

CONGENITAL ABSENCE OF RADII AND FIBULÆ.

1330a. A Photograph of a child æt. 2 years, showing congenital absence of both radii and fibulæ.

See *St. Bartholomew's Hospital Reports*, vol. xxxii. (1896), p. 399.

1330b. A Photograph of a child æt. 8 years, showing congenital absence of both radii.

See *St. Bartholomew's Hospital Reports*, vol. xxxii. (1896), p. 399.

CONGENITAL MALFORMATION OF ARM.

1330c. A Photograph of the Upper Extremities of a boy, showing a congenital malformation of the right arm and hand.

From the Out-Patient Department.

CONGENITAL SACRAL TUMOUR.

1336a. Two Photographs of a Congenital Sacral Tumour in a man æt 55 years, probably becoming malignant.

See *Male Surgical Register*, vol. v. (1896), No. 3282.

CONGENITAL FISTULA.

1338a. Drawing of a child 10 days old, showing a congenital fistula in the middle line of the neck. (L. Mark.)

See *Female Surgical Register*, vol. iii. (1896), No. 2728.

CONGENITAL CONSTRICTION OF FORE-ARM.

1359. Two Photographs of the Right Hand and Arm, showing a congenital constriction above the wrist, which has caused great deformity through obstruction of the vessels. (From a man æt. 27 years.)

A cast of the hand will be found in Series xxxvii. No. 97b.

See *Male Surgical Register*, vol. ii. (1896), No. 2937.

FACIAL DIAGNOSIS.**BASAL MENINGITIS.**

1374. A Drawing of a child æt. 1 year, suffering from posterior basal meningitis, showing extreme arching of the back, retraction of the head, and rigidity of the hands, arms, and legs. (L. Mark.)

See *Male Medical Register*, vol. i. (1897), No. 123.

CRETINISM.

1375. Drawing of a female Cretin æt. 14 years. (L. Mark.)

See *Female Medical Register*, vol. v. (1897), No. 77.

III.

HISTOLOGICAL RECORDS OF MUSEUM SPECIMENS.*

- i. **481b.** Microscopic Section accompanying Specimen 481b in Series i. (embedded in paraffin and stained with hæmatoxylin). The growth is a typical mixed-celled sarcoma containing numerous giant cells (myeloid cells). (Prepared by E. H. Shaw.)

See Series i. No. 481b (Sarcoma of Femur).

- i. **481c.** Microscopic Section accompanying Specimen 481c in Series i. (embedded in paraffin and stained with hæmatoxylin). The growth is a mixed-celled sarcoma with myxomatous and osteoid deposits. The latter are becoming calcareous, and the infiltration with calcareous granules is extremely well shown. (Prepared by E. H. Shaw.)

See Series i. No. 481c (Sarcoma of Femur).

- i. **483a.** Section accompanying Specimen 483a in Series i., melanotic sarcoma in vertebra (decalcified, embedded in paraffin and stained with hæmatein and eosin). In the cancellous spaces pigmented sarcoma cells can be seen, especially on using the high power. (Prepared by T. Strangeways Pigg.)

See Series i. No. 483a.

- i. **540a.** Two Sections accompanying the Specimen of dentigerous cyst, No. 540a in Series i. (embedded in paraffin and stained with hæmatoxylin). The growth in Section (a) is papillomatous, the papillæ being lined by cubical or short columnar epithelium, the matrix of the papillæ being fibrous or myxomatous. In Section (b) ingrowing epithelial columns can be seen, the epithelium being small and the columns arranged like those found in multilocular cystic tumours of the jaw. (Prepared by E. H. Shaw.)

See Series i. No. 540a.

- vi. **1174f.** Section of Melanotic Sarcoma in muscle in Series vi. No. 1174f (embedded in paraffin and stained with hæmatein). (Prepared by H. D. O'Sullivan.)

See Series vi. No. 1174f.

* The Roman figure refers to the Series, the ordinary figure to the number of the Specimen.

- vii. 1289a. Section of Melanotic Sarcoma of the Heart in Series vii. No. 1289a (embedded in paraffin and stained with hæmatein). The growth is but slightly pigmented. (Prepared by H. D. O'Sullivan.)
See Series vii. No. 1289a.
- x. 1616c. Section accompanying Specimen of Diphtheritic Cast in Series x. No. 1616c (embedded in paraffin and stained by Weigert's fibrin method). It shows diphtheria bacilli. (Prepared by T. Strangeways Pigg.)
See Series x. No. 1616c.
- x. 1618a. Section of Trachea from Specimen in Series x. No. 1618a (stained by Gram-Weigert's method). It shows typical diphtheria bacilli and the ordinary appearances of diphtheria, but no tubercle bacilli were found. (Prepared by T. Strangeways Pigg.)
See Series x. No. 1618a.
- x. 1633f₁. Sections of a Tubercular Trachea preserved in Series x. No. 1633f₁ (both embedded in paraffin). One is stained with hæmatein, and shows tubercular changes in the mucosa, which is ulcerated and extremely vascular; there is, however, only one giant cell to be found. The other section is stained for tubercle bacilli, which are readily found. (Prepared by T. Strangeways Pigg.)
See Series x. No. 1633f₁.
- x. 1658a. Section of Sarcoma of the Trachea preserved in Series x. No. 1658a (embedded in paraffin and stained with hæmatein). The growth is a very vascular sarcoma. (Prepared by E. H. Shaw.)
See Series x. No. 1658a.
- xi. 1678b. Microscopic Section of Specimen 1678b in Series xi. (frozen and stained with alum carmine). (Prepared by T. Strangeways Pigg.)
See Series xi. No. 1678b (Carcinoma of Pleura).
- xi. 1678e. Section of Melanotic Sarcoma of Pleura in Series xi. No. 1678e (embedded in paraffin and stained with hæmatein and eosin). (Prepared by E. C. Morland.)
See Series xi. No. 1678e.
- xi. 1702a. Microscopic Section of Specimen No. 1702a in Series xi. (frozen and stained with hæmatein). (Prepared by T. Strangeways Pigg.)
See Series xi. No. 1702a (Edema of Lung).
- xi. 1744a. Microscopic Section of Specimen No. 1744a in Series xi. (embedded in paraffin and stained with gentian violet). (Prepared by T. Strangeways Pigg.)
See Series xi. No. 1744a (Chondro-Carcinoma of Lung).

XII. 1763b. Section accompanying Specimen 1763b in Series xii. (embedded in paraffin and stained with hæmatein). The growth was removed from the septum nasi and is evidently tubercular. (Prepared by T. Strangeways Pigg.)

See Series xii. No. 1763b.

XII. 1788h₁. Section accompanying the Specimen of Epithelioma of Tongue, No. 1788h₁ in Series xii. (frozen and stained with alum carmine). The growth is a typical squamous-celled carcinoma.

See Series xii. No. 1788h₁.

XII. 1807b₁. Section accompanying the Specimen of Polypus of the Tonsil, No. 1807b₁ Series xii. (embedded in paraffin and stained with hæmatein). The growth is an ordinary fibroma lined by squamous epithelium. (Prepared by E. H. Shaw.)

See Series xii. No. 1807b₁.

XIV. 1832a₁. Section accompanying Specimen 1832a₁ in Series xiv. (embedded in paraffin and stained with hæmatein). The growth is a typical melanotic sarcoma. (Prepared by T. Strangeways Pigg.)

See Series xiv. No. 1832a₁ (Melanotic Sarcoma of Parotid Gland).

XIV. 1832a₂. Microscopic Section prepared from Specimen 1832a₂ in Series xiv. (stained with Ehrlich's hæmatoxylin). It is a melanotic sarcoma. (Prepared by E. Willett, Esq.)

See Series xiv. No. 1832a₂ (Melanotic Sarcoma of Parotid Gland).

XV. 1837b. Microscopic Section of Specimen 1837b in Series xv. (embedded in paraffin and stained with alum carmine and Weigert's fibrin method). The diphtheria bacilli are well shown. (Prepared by T. Strangeways Pigg.)

See Series xv. No. 1837b (Gangrenous Diphtheria).

XVI. 1885e. Microscopic Specimen of No. 1885e in Series xvi. (embedded in paraffin and stained with hæmatein and eosin). It shows a little cyst lined by flat endothelial cells. (Prepared by T. Strangeways Pigg.)

See Series xvi. 1885e (Omental Cysts).

XVI. 1886e₁. Microscopic Section of Specimen No. 1886e₁ in Series xvi. (embedded in paraffin and stained with hæmatein and eosin). The fatty tissue of the appendix epiploica, from which the section has been prepared, is infiltrated by a cellular, apparently sarcomatous growth, which shows also curious multinucleated round and oval giant cells without lateral processes, the nuclei being nearly symmetrically arranged at the periphery of the cell. These giant cells are fairly numerous, and many of them resemble those generally found in a tubercle. Some of these giant cells are, however, cylindrical in shape or of irregular outline. The growth is either a sarcoma or an endothelioma. (Prepared by E. H. Shaw.)

See Series xvi. No. 1886e₁.

- xvi. **1886g.** Section accompanying Specimen 1886g in Series xvi. (embedded in paraffin and stained with hæmatein). The growth is a fibro-sarcoma. (Prepared by T. Strangeways Pigg.)
See Series xvi. No. 1886g (Sarcoma of Peritoneum).
- xvii. **1918c.** Microscopic Section of Specimen 1918c in Series xvii. (embedded in paraffin and stained with alum carmine and Weigert's fibrin method). (Prepared by T. Strangeways Pigg.)
See Series xvii. No. 1918c (Multiple Hæmorrhages in Stomach).
- xvii. **1935b.** Section accompanying Specimen 1935b in Series xvii. (frozen and stained by Weigert's fibrin method). The piece was taken from a carcinoma of the stomach, and the section has been prepared especially to bring out the colloid changes. The growth is a colloid columnar-celled carcinoma. (Prepared by T. Strangeways Pigg.)
See Series xvii. No. 1935b.
- xvii. **1951d.** Microscopic Specimen of the Carcinoma of Pylorus preserved in Series xvii. No. 1951d (embedded in paraffin and stained with hæmatein and eosin). Histologically the growth is a typical colloid columnar-celled carcinoma. (Prepared by E. H. Shaw.)
See Series xvii. No. 1951d.
- xviii. **1955a.** Section accompanying Specimen 1955a in Series xviii. (embedded in paraffin and stained with hæmatein and eosin). The section shows areas of atrophy of the mucosa and its follicles, alternating with areas where the mucosa is in a catarrhal condition. (Prepared by E. H. Shaw.)
See Series xviii. No. 1955a (Atrophy of the Mucous Membrane of the Large Intestine).
- xviii. **2019f₁.** Microscopic Sections of Specimen No. 2019f₁ preserved in Series xviii. The section has been made in the long axis of the bowel through the polypoid excrescences. The latter are due to hypertrophy of the mucosa, and resemble in every respect Specimen No. 2019e. (Prepared by E. H. Shaw.)
See Series xviii. No. 2019f₁ (Multiple Polypi of Small Intestine).
- xviii. **2026a.** Section of the Melanotic Sarcoma of the Small Intestine, No. 2026a in Series xviii. (embedded in paraffin and stained with hæmatein). (Prepared by E. H. Shaw.)
See Series xviii. No. 2026a.
- xviii. **2036a.** Section of a Papilloma of the Vermiform Appendix which is preserved in Series xviii. No. 2036a (embedded in paraffin and stained with hæmatein and eosin). The specimen represents a typical innocent papilloma. (Prepared by E. H. Shaw.)
See Series xviii. No. 2036a.

- xxi. 2209c.** Section of Melanotic Sarcoma of the Liver in Series xxi. No. 2209c (embedded in paraffin and stained with hæmatein). (Prepared by E. C. Morland.)
See Series xxi. No. 2209c.
- xxiii. 2276b.** Section of Melanotic Sarcoma of Pancreas in Series xxiii. No. 2276b (embedded in paraffin and stained with hæmatein). (Prepared by E. C. Morland.)
See Series xxiii. No. 2276b.
- xxiv. 2278b.** Section accompanying Specimen of Lymphadenoma in Series xxiv. No. 2278b (embedded in paraffin and stained with hæmatein and eosin). The growth consists of lymphocytes and numerous large endothelial cells. (Prepared by E. H. Shaw.)
See Series xxiv. No. 2278b (Lymphadenoma).
- xxv. 2304b.** Section of Melanotic Sarcoma of the Spleen in Series xxv. No. 2304b (embedded in paraffin and stained with hæmatein). The growth, a secondary deposit, shows no melanin. (Prepared by E. C. Morland.)
See Series xxv. No. 2304b.
- xxvi. 2312b.** Section of Cystic Adenoma of the Thyroid Gland preserved in Series xxvi. No. 2312b (embedded in paraffin and stained with hæmatein and eosin). Histologically the growth is a typical cystic or follicular adenoma. (Prepared by E. H. Shaw.)
See Series xxvi. No. 2312b
- xxvi. 2318d.** Section of Melanotic Sarcoma of the Thyroid Gland in Series xxvi. No. 2318d (embedded in paraffin and stained with hæmatein). The growth is unpigmented. (Prepared by E. C. Morland.)
See Series xxvi. No. 2318d.
- xxvii. 2330d.** Section of Melanotic Sarcoma of Suprarenal Capsule in Series xxvii. No. 2330d (embedded in paraffin and stained with hæmatein and eosin). The growth is but slightly pigmented. (Prepared by E. C. Morland.)
See Series xxvii. No. 2330d.
- xxviii. 2334c.** Section accompanying Specimen 2334c in Series xxviii. (frozen and stained with alum carmine). The section contains extensive interstitial changes and crowding of the glomeruli, due to contraction. Prepared by T. Strangeways Pigg.)
See Series xxviii. No. 2334c (Contracting White Kidney).
- xxviii. 2338d.** Microscopic Section of Specimen 2338d in Series xxviii. (embedded in paraffin and stained with hæmatein and eosin). (Prepared by E. H. Shaw.)
See Series xxviii. No. 2338d (Acute Suppurative Nephritis).

xxviii. 2343a. Section accompanying Specimen 2343a in Series xxviii. (frozen and stained with hæmatoxylin). The section shows patches of caseation, with round-celled infiltration and fibrous changes and also giant cells, which hide the kidney tubules and in part replace them.

See Series xxviii. No. 2343a (Syphilitic Kidney).

xxviii. 2390d₁. Section of Melanotic Sarcoma of Kidney in Series xxviii. No. 2390d₁ (embedded in paraffin and stained with hæmatein and eosin). (Prepared by E. C. Morland.)

See Series xxviii. No. 2390d₁.

xxviii. 2390d₂. Section of Melanotic Sarcoma of Kidney in Series xxviii. No. 2390d₂ (embedded in paraffin and stained with hæmatein). The growth, a secondary deposit, is unpigmented. (Prepared by H. D. O'Sullivan.)

See Series xxviii. No. 2390d₂.

xxviii. 2391c. Section accompanying Specimen 2391c in Series xxviii. (frozen and stained with alum carmine). The growth is a round-celled sarcoma.

See Series xxviii. No. 2391c (Sarcoma of Kidney).

xxviii. 2391d. Section (frozen) of a malignant growth in the left sternomastoid muscle, secondary to a growth in the kidney. The specimen is stained with alum carmine and is a typical mixed-celled sarcoma. (Prepared by T. Strangeways Pigg.)

See Series xxviii. No. 2391d.

xxviii. 2392e. Five Specimens illustrating Specimen 2392e in Series xxviii. These have been briefly described together with the gross specimen. In some parts the sections of the kidney show nothing but large concentric masses of uncertain nature, and in other parts the growth in the kidney is evidently malignant, there being small delicate tubules embedded in a dense fibrous stroma. The epithelium of the tubules appears to be fusiform and small (?squamous). The growth near the ureter strongly resembles squamous-celled carcinoma, and contains concentric cell nests. The deposits in the liver are almost identical with those near the ureter, and show many small tubular structures and numerous concentric cell nests. (Prepared by T. Strangeways Pigg.)

See Series xxviii. No. 2392e (Carcinoma of Kidney).

xxix. 2418b. Section accompanying the Papilloma of the Bladder in Series xxix. No. 2418b (embedded in paraffin and stained with hæmatein). The growth is a typical villous papilloma lined by columnar epithelium. (Prepared by E. H. Shaw.)

See Series xxix. No. 2418b.

xxx. 2465d. Section of Specimen No. 2465d in Series xxx. (embedded in paraffin and stained with hæmatein). It is evidently a spindle-celled sarcoma. In some sections concentric bodies were found, but this specimen does not show them. (Prepared by T. Strangeways Pigg.)

See Series xxx. No. 2465d (Meningeal Sarcoma).

xxxiii. 2606a. Section of a Melanotic Sarcoma of the Eye, preserved in Series xxxiii. No. 2606a (embedded in paraffin and stained with hæmatein). (Prepared by T. Strangeways Pigg.)

See Series xxxiii. No. 2606a.

xxxvi. 2784. Microscopic Section of Specimen 2784 in Series xxxvi. (embedded in paraffin and stained with gentian violet). (Prepared by T. Strangeways Pigg.)

See Series xxxvi. No. 2784 (Chondro-Carcinoma of Testis).

xxxvi. 2785. Microscopic Section of Specimen 2785 in Series xxxvi. (embedded in paraffin and stained with gentian violet). (Prepared by T. Strangeways Pigg.)

See Series xxxvi. No. 2785 (Chondro-Carcinoma of Vena Cava).

xxxvi. 2786. Microscopic Section of Specimen 2786 in Series xxxvi. (embedded in paraffin and stained with gentian violet). (Prepared by T. Strangeways Pigg.)

See Series xxxvi. No. 2786 (Chondro-Carcinoma of Lymphatic).

xxxvi. 2797m. Microscopic Section of Specimen No. 2797m in Series xxxvi. (embedded in paraffin and stained with gentian violet). (Prepared by T. Strangeways Pigg.)

See Series xxxvi. No. 2797m (Carcinoma of Testis).

xxxvi. 2797n. Microscopic Section of Specimen 2797n in Series xxxvi. (embedded in paraffin and stained with hæmatein). (Prepared by T. Strangeways Pigg.)

See Series xxxvi. No. 2797n (Carcinoma of Vena Cava).

xxxvi. 2797o. Microscopic Section of Specimen 2797o in Series xxxvi. (embedded in paraffin and stained with hæmatein). (Prepared by T. Strangeways Pigg.)

See Series xxxvi. No. 2797o (Carcinoma of Heart).

xxxvi. 2797p. Section of a Melanotic Sarcoma of the Testis, preserved in Series xxxvi. No. 2797p (embedded in paraffin and stained with hæmatein and eosin). (Prepared by T. Strangeways Pigg.)

See Series xxxvi. No. 2797p.

xxxix. 2854a₁. Histological Specimen of a Sarcoma of the Prostate Gland which is preserved in Series xxxix. No. 2854a₁ (frozen and stained

with hæmatein). The growth is composed chiefly of spindle cells and fibrous tissue: spindle-celled sarcoma with fibrous tissue (fibro-sarcoma). (Prepared by T. Strangeways Pigg.)

See Series xxxix. No. 2854a.

XLI. 2913c. Section of Specimen 2913c in Series xli. (embedded in paraffin and stained with hæmatein). The growth is papillary, its matrix myxomatous, and the lining epithelium columnar. There is no evidence of carcinoma. (Prepared by T. Strangeways Pigg.)

See Series xli. No. 2913c (Papilloma of Ovary).

XLI. 2913d. Section of Specimen 2913d in Series xli. (embedded in paraffin and stained with hæmatein and eosin). It shows apparently an innocent cystic papilliferous and papillomatous growth, the cystic spaces being filled with mucus. (Prepared by E. H. Shaw.)

See Series xli. No. 2913d (Papilloma of Ovary).

XLI. 2925c. Section accompanying Specimen 2925c in Series xli. (frozen and stained with alum carmine). The growth is a hard fibroma.

See Series xli. No. 2925c (Calcifying Fibroma of Ovary).

XLII. 2938g. Section of the Specimen of Carcinoma of the Fallopian Tube, No. 2938g in Series xlii. (embedded in paraffin and stained with hæmatein). The muscular wall of the Fallopian tube is greatly hypertrophied, and in places invaded by carcinomatous alveoli, filled and lined by small cells. The surface of the growth is papillomatous. The character of the epithelium is not easily made out, but appears to be short columnar. (Prepared by E. H. Shaw.)

See Series xlii. No. 2938g.

XLIV. 3031a. Section accompanying Specimen 3031a in Series xliv. (embedded in paraffin and stained with hæmatein). The growth is a typical squamous-celled carcinoma. (Prepared by E. H. Shaw.)

See Series xliv. No. 3031a (Epithelioma of Vagina).

XLVIII. 3172b. Microscopic Section of Specimen No. 3172b in Series xlviii. (frozen and stained with alum carmine) it is a typical carcinoma (columnar-celled).

See Series xlviii. No. 3172b (Carcinoma of Breast).

XLVIII. 3176a. Section accompanying Specimen 3176a in Series xlviii. (frozen and stained with alum carmine). The growth is a typical carcinoma of the breast: the fibrous tissue in parts is considerably sclerosed and hypertrophied, but in other parts but slightly developed.

See Series xlviii. No. 3176a (Ulcerating Carcinoma of Breast)

XLVIII. 3179b. Section accompanying Specimen 3179b in Series *xlviii*. (frozen and stained with alum carmine). The growth is a typical carcinoma mammæ, showing extreme sclerosis and hyperplasia of the interstitial tissue.

See Series *xlviii*. No. 3179b (Fungating Carcinoma of Breast).

L. 3269a. Microscopic Specimen (frozen section) of a Fibrous Tumour which grew in connection with a chronic ulcer of the leg. It has been stained with alum carmine, and shows no sarcomatous elements, but only fibrous and areolar tissue and round-cell infiltration on the surface, which is evidently of inflammatory origin.

See Series 1. No. 3269a (Fibroma springing from Chronic Ulcer of Leg).

L. 3280b. Section accompanying Specimen 3280b in Series 1. (embedded in paraffin and stained with hæmatein). The growth is a vascular fibroma.

See Series 1. No. 3280b (Pendulous Fibroma of Perineum).

L. 3316a. Section of Melanotic Sarcoma of Skin over the Breast (embedded in paraffin and stained with hæmatein). (Prepared by E. H. Shaw.)

See Series 1. No. 3316a (Melanotic Sarcoma of Skin).

L. 3318k. Section accompanying Specimen 3318k in Series 1. (embedded in paraffin and stained with hæmatein and eosin). The growth consists mainly of large endothelial cells, and resembles in structure a so-called endothelioma. (Prepared by T. Strangeways Pigg.)

See Series 1. No. 3318k (Endothelioma).

L. 3371f. Two Transverse Sections of a "Branchial Fistula" (embedded in paraffin and stained with hæmatein). The surface is lined by columnar ciliated epithelium, shed in parts; the wall of the "duct" itself shows adenoid tissue, partly arranged in follicles. (Prepared by E. H. Shaw.)

See Series 1. No. 3371f (Branchial Fistula).

L. 3382k. Section accompanying Specimen 3382k in Series 1. (embedded in paraffin and stained by Weigert's fibrin method). The specimen shows numerous air cysts, and in their walls bacilli stained dark blue (*B. aerogenes capsulatus*); many bacilli are found in the cystic contents. (Prepared by T. Strangeways Pigg.)

See Series 1. No. 3382k (Emphysematous Ovarian Cyst).

SERIES XXXVII.

CASTS OF CONGENITAL MALFORMATIONS.

CONGENITAL CONSTRICTION OF FOREARM.

- 97b. Cast of the Right Hand of a man *æt.* 27 years, showing great deformity, due to *œdema*, caused by a very tight congenital constriction just above the wrist; the fingers are represented by short stumps. The 1st, 2nd, and 3rd fingers of the left hand were represented by short stumps, the thumb and little finger being normal.

For photographs of the right hand see Series lvii. No. 1359.
See *Male Surgical Register*, vol. ii. (1896), No. 2937.

CONGENITAL DEFORMITY OF HAND.

- 106a. Cast of the Left Hand of a woman *æt.* 33 years with congenital shortening of the third metacarpal bone..

The right hand showed the same deformity.

See *Female Medical Register*, vol. vi. Part ii. (1896), No. 392.

IV

ALPHABETICAL INDEX

OF THE

CASTS AND MODELS OF DISEASED AND
INJURED PARTS

(SERIES LVI.)

IN THE

MUSEUM OF ST. BARTHOLOMEW'S HOSPITAL

1897

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V

ALPHABETICAL INDEX

OF THE

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AND MALFORMATIONS

(SERIES XXXVII.)

IN THE

MUSEUM OF ST. BARTHOLOMEW'S HOSPITAL

1897

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10. A. E. THOMAS.

SENIOR.

*Foster Prize—*A. T. COMPTON.

2. J. S. WILLIAMSON.
3. A. E. LISTER.
4. M. G. WINDER.
5. C. A. S. RIDOUT.
6. A. T. PRIDHAM.
7. A. R. TWEEDIE.
8. R. H. R. WHITAKER.
9. J. C. NEWMAN.
10. G. M. SEAGROVE.

Shuter Scholarship—

F. A. BAINBRIDGE }
 B. TRUMAN } Æq.

Junior Scholarships—

1. R. C. ELMSLIE.
2. F. GRÖNE.

Junior Scholarship in Chemistry—

1. J. S. WILLIAMSON.
2. E. G. SMITH.

ENTRANCE SCHOLARSHIPS,

OCTOBER

1897.

Open Scholarships in Science.

Biology and Physiology—

W. MORLEY FLETCHER, B.A., Trinity College, Cambridge.

Chemistry and Physics—

C. ERNEST WEST, B.A., Balliol College, Oxford.

Preliminary Scientific Exhibition—

E. G. PRINGLE.

Jeaffreson Exhibition—

N. R. TOSSWILL.

Junior Open Scholarship in Science.

H. K. KIDNER } \pounds Eq.
E. C. WILLIAMS }

ST. BARTHOLOMEW'S HOSPITAL & COLLEGE.

THE MEDICAL AND SURGICAL STAFF.

- Consulting Surgeons—Sir J. Paget, Bart., D.C.L., LL.D., F.R.S.
 Mr. Luther Holden, Sir Thomas Smith, Bart.
- Consulting Ophthalmic Surgeon—Mr. Henry Power.
- Physicians—Dr. Church, Dr. Gee, Sir Dyce Duckworth,
 Dr. Hensley, Dr. Brunton, F.R.S.
- Surgeons—Mr. Willett, Mr. Langton, Mr. Marsh, Mr. Butlin,
 Mr. Walsham.
- Assistant-Physicians—Dr. Norman Moore, Dr. S. West, Dr.
 Ormerod, Dr. Herringham, Dr. Tooth.
- Assistant-Surgeons — Mr. Cripps, Mr. Bruce Clarke, Mr.
 Bowlby, Mr. Lockwood, Mr. D'Arcy Power.
- Physician-Accoucheur—Dr. Champneys.
- Assistant-Physician-Accoucheur—Dr. Griffith.
- Assistant-Surgeon to Obstetric Wards—Mr. Harrison Cripps.
- Ophthalmic Surgeons—Mr. Vernon, Mr. Jessop.
- Aural Surgeon—Mr. Cumberbatch.
- Pathologist—Dr. F. W. Andrewes.
- Dental Surgeons—Mr. Paterson, Mr. Ackery.
- Assistant-Dental Surgeons—Mr. Read, Mr. Ackland.
- Administrators of Anæsthetics—Mr. Gill, Mr. Edgar Willett.
- Medical Registrars—Dr. Calvert, Dr. Garrod.
- Surgical Registrar—Mr. Waring.
- Administrator of Electricity—Dr. Lewis Jones.
- Casualty Physicians—Dr. Batten, Dr. Horne.

LECTURES.

Medicine—Sir Dyce Duckworth, Dr. Norman Moore.

Clinical Medicine—Dr. Church, Dr. Gee, Sir Dyce Duckworth,
Dr. Hensley, Dr. T. Lauder Brunton, F.R.S.

Surgery—Mr. Marsh, Mr. Walsham.

Clinical Surgery—Mr. Willett, Mr. Langton, Mr. Marsh, Mr.
Butlin, Mr. Walsham.

Descriptive and Surgical Anatomy—Mr. Bruce Clarke, Mr.
Lockwood.

General Anatomy and Physiology with Histology—Dr. Klein,
F.R.S.

Chemistry and Practical Chemistry—Dr. F. D. Chattaway.

Materia Medica, Pharmacology, and Therapeutics — Dr.
Brunton, F.R.S.

Forensic Medicine—Dr. Hensley.

Public Health—Sir Richard Thorne Thorne, K.C.B., F.R.S.

Midwifery and the Diseases of Women and Children—Dr.
Champneys.

Botany—Rev. George Henslow.

Pathological Anatomy—Dr. F. W. Andrews.

Biology and Comparative Anatomy—Dr. Shore.

Ophthalmic Medicine and Surgery—Mr. Vernon.

Mental Diseases—Dr. Claye Shaw.

Physics—Mr. F. W. Womack.

Chemical Physiology—Dr. Edkins.

Organic Chemistry—Dr. Chattaway.

DEMONSTRATIONS.

Morbid Anatomy—Dr. Calvert, Dr. Garrod.

Diseases of the Skin—Dr. S. West.

Orthopædic Surgery—Mr. Bruce Clarke.

Diseases of the Ear—Mr. Cumberbatch.

Diseases of the Eye—Mr. Jessop.

Diseases of the Larynx—Mr. Bowlby.

Dental Surgery—Mr. Paterson, Mr. Ackery.

Anæsthetics—Mr. Gill.

Practical Surgery—Mr. D'Arcy Power, Mr. Berry.

Practical Anatomy—Mr. Bailey, Mr. Furnivall.

Assistant-Demonstrators—Mr. Sloane, Mr. Miles, Mr. Phillips.

Operative Surgery—Mr. D'Arcy Power, Mr. H. J. Waring,
Mr. Eccles.

Practical Physiology—Dr. Edkins.

Assistant-Demonstrators—Dr. W. G. Clark, Dr. Horder.

Practical Pharmacy—Dr. Morley Fletcher.

Surgical Pathology—Mr. Bowlby.

Pathology and Morbid Histology—Dr. Drysdale, Mr. J. H.
Churchill, Dr. Horne.

Practical Medicine—Dr. S. West.

Assistant-Demonstrators—Dr. Fletcher, Dr. Horton Smith.

Practical Midwifery—Dr. Morrison.

Medical Electricity—Dr. Lewis Jones.

Bacteriology—Dr. F. W. Andrewes.

Public Health—Dr. Waldo.

Practical Biology—Dr. Shore.

Assistant-Demonstrators—Mr. Cammage, Mr. Thomas.

Practical Chemistry—Dr. Chattaway.

Assistant-Demonstrator—Mr. Evans.

Curator of the Museum—Dr. F. W. Andrewes.

Assistant-Curator—Dr. Morley Fletcher.

COLLEGIATE ESTABLISHMENT.

Warden—Dr. CALVERT.

Students can reside within the Hospital walls, subject to the College regulations.

Fifteen Scholarships, varying in value from £10 to £150, are awarded annually. See page 316.

Further information respecting Scholarships, Pupils' Appointments, and other details, may be obtained from Dr. CALVERT, and at the Museum and Library.

ST. BARTHOLOMEW'S HOSPITAL REPORTS.

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STATISTICAL TABLES

OF THE

Patients under Treatment

IN THE WARDS OF

ST. BARTHOLOMEW'S HOSPITAL

DURING 1896,

BY

THE MEDICAL REGISTRARS,

JAMES CALVERT, M.D. (LOND.), F.R.C.P.,

AND

ARCHIBALD E. GARROD, M.D. (OXON.), F.R.C.P.,

AND

THE SURGICAL REGISTRAR,

JAMES BERRY, B.S. (LOND.), F.R.C.S.

London:

PRINTED BY CHARLES SKIPPER AND EAST,
49, GREAT TOWER STREET, E.C.

1897.

P R E F A C E.

The Classification of Diseases in the Medical Tables is that adopted by the College of Physicians in their Nomenclature of Diseases.

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ST. BARTHOLOMEW'S HOSPITAL.

1896.

Number of Beds in Medical Wards	241
" " " Wards for Diseases of Women	34
" " " Surgical Wards	...	...	...	...	...	...	336
" " " Ophthalmic Wards	..	...	...	...	...	...	25
" " " Unassigned	...	...	...	...	...	...	38
							674
							674

GENERAL STATEMENT OF THE PATIENTS UNDER TREATMENT DURING THE YEAR 1896.

Patients remaining in, January 1st, 1896 :—

Medical	243	} ... 559
Surgical	316	

Admitted during the year 1896 :—

Medical	2,682	} ... 6,841
Surgical	4,159	

} ... 7,400

Discharged :—

Medical	2,268	} ... 6,235
Surgical	3,967	

Died :—

Medical	418	} ... 640
Surgical	222	

} ... 7,400

Remaining in, January 1st, 1897 :—

Medical	239	} ... 525
Surgical	286	

Patients brought in Dead :—

Medical	16	} ... 23
Surgical	7	

Dying in the Surgery or Surgery Ward :—

Medical	43	} ... 59
Surgical	16	

} ... 82

OCCUPATIONS OF MALE PATIENTS.

Accountants	2	Chair makers... .. .	4	Firemen	10
Actors	2	Charcoal burner	1	Fish curers	2
Agents	8	Checkers	5	Fishermen	2
Apprentices	2	Chemists	7	Fishmongers	11
Architects	2	Chimney sweeps	6	Fish porters	2
Artist	1	Cigar makers... .. .	4	Fitters... .. .	5
Asphalter	1	Clergymen	3	Flax worker	1
Athlete	1	Clerks	83	Floor-cloth printer	1
Auctioneer	1	Clicker	1	Florist	3
		Clockstand makers	2	Footmen	6
Bacon dryer	1	Cloth cutters... .. .	2	Foremen	5
Bag maker	1	Clothier	1	French polishers	25
Bailiff	1	Coach builder	1	Fret cutter	1
Bakers	12	Coachmen	22	Fruiters	3
Bamboo worker	1	Coach painters	5	Furniture dealer	1
Barbers	4	Coach trimmers	2	Furniture mover	1
Barmen	18	Coalheaver	1	Furniture painter	1
Basket makers	3	Coffee house keeper	1	Furrier	1
Bell hanger	1	Colourman	1		
Billiard markers	3	Colour sorter	1	Gamekeepers	5
Billposter	1	Comb finisher	1	Gardeners	25
Blacksmiths	16	Compositors	37	Gas fitters	11
Boiler makers	5	Confectioners	6	Gas workers	7
Book binders... .. .	24	Cooks	10	Gilder... .. .	1
Book keepers... .. .	2	Coopers	10	Glass blowers... .. .	4
Book sellers	2	Copper scourer	1	Glaziers	4
Boot finishers	9	Coppersmiths... .. .	2	Gluepot filler... .. .	1
Boot lasters	3	Cork cutters	4	Gold swivel maker	1
Boot makers	37	Cork sorter	1	Golf professional	1
Bottlers	2	Cordealer	1	Greengrocers... .. .	6
Bottle washers	2	Costermongers	2	Grocers	6
Boxer	1	Cricketer professional... .. .	4	Grooms	10
Box makers	6	Cutler... .. .	1	Gun makers	2
Brakesman	1	Cycle maker	1		
Brace maker	1			Hairdressers	7
Brass finishers	4	Dealers	5	Hall porter	1
Brass founder	1	Decorators	2	Harness makers	3
Brewers	6	Dentists	2	Hatters	2
Bricklayers	21	Designer	1	Hawkers	24
Brick makers... .. .	3	Detective	1	Hay binder	1
Broker	1	Diamond polisher	1	Horsehair workers	3
Brush makers	4	Drapers	4	Horse keepers	17
Builders	7	Draughtsman	1	Hosiers	2
Butchers	28	Drayman	1	Hotel porters... .. .	2
Butlers	4	Dressing-case makers	2	House breakers	3
Butterman	1	Driller... .. .	1	Housekeepers... .. .	3
Button maker	1	Drivers	18		
		Druggist	1	Ice-cream vendors	2
Cabinet makers	21	Dustmen	4	Indiarubber worker	1
Cabmen	23	Dyers	2	Inspector	1
Cap stamper	1			Instrument makers	5
Capsule makers	3	Electricians	3	Ironmonger	1
Caretakers	5	Engine drivers	10	Iron workers	6
Carmen	93	Engine cleaner	1	Isinglass trimmer	1
Carpenters	44	Engineers	32	Ivory trimmer	1
Carriage maker	1	Engravers	2		
Carriers	6	Envelope makers	2	Japanner	1
Carter	1	Excavator	1	Jewel-case maker	1
Case maker	1			Jewellers	2
Cashiers	3	Factory men	2	Joiners	2
Catsmeat man	1	Fancy box maker	1	Journalists	2
Cellarmen	6	Farmers	6		
Cement burner	1	Farriers	4	Labourers	247
Chaffcutter	1	File cutter	1	Lamp lighter	1

OCCUPATIONS OF MALE PATIENTS (*continued*).

Last makers 3	Plasterers 6	Stationers 5
Laundrymen 3	Plaster modeller ... 1	Stationmasters ... 3
Lavatory attendant... 1	Platelayers 5	Stereotypers 3
Lead workers... .. 3	Plater 1	Stevedores 7
Leather cutters ... 3	Plumbers 15	Stewards 7
Leather dressers ... 4	Policemen 10	Stick makers... .. 6
Librarian 1	Polisher 1	Stockbroker 1
Lift men 3	Polish maker... .. 1	Stokers 13
Lightermen 3	Porters 108	Storekeepers 6
Lithographers 5	Portmanteau maker... 1	Students 27
Lodge keeper... .. 1	Postmen 14	Stylographic pen maker 1
Lunatic attendant ... 1	Potmen 14	Superintendent ... 1
	Potter... .. 1	Surgery boy 1
Machine oiler 1	Poulterers 2	Surveyor 1
Machinists 8	Printers 52	Sweet maker 1
Manufacturer 1	Provision dealer ... 1	
Map mounter... .. 1	Publicans 2	Tailors 29
Marble polishers ... 2	Purser 1	Tanner 1
Marionette figure worker 1		Tea blenders 8
Masons 12	Quarrymen 2	Teachers 2
Medical practitioners 2	Quartermaster 1	Tea coopers 3
Merchant 1		Tea planter 1
Messengers 35	Rag merchant 1	Telegraphists... .. 9
Metal workers 10	Railway servants ... 21	Telephonist 1
Milkmen 4	Reader 1	Ticket collector ... 1
Miller 1	Relieving officer ... 1	Ticket writer... .. 1
Miners... .. 10	Restaurant manager... 1	Tie cutter 1
Missionary 1	Riveters 2	Timber carriers ... 2
Mould turner... .. 1	Rope maker 1	Timekeepers 3
Musicians 3		Tinfoil maker 1
Muzzle maker 1	Sack maker 1	Tin smelter 1
	Saddle maker 1	Tinsmith 10
Navy 1	Safe makers 2	Tobacconists 2
News agents 2	Sailors... .. 31	Travellers 20
News vendors 7	Salesmen 3	Turners 4
Night lift worker ... 1	Salter 1	Truck boy 1
	Sawyers 10	Type founders 4
Office boys 2	Scaffolders 6	Typewriters 2
Office keeper 1	Scalesman 1	
Oilman 1	Scarecrow 1	Umbrella makers ... 3
Omnibus conductors... 7	Scavengers 5	Undertakers 2
Omnibus driver 1	School boys 336	Upholsterers 2
Organ builders 2	Schoolmasters 3	
Organ grinder 1	Screw maker 1	Valets... .. 2
Ostlers 6	Scullerymen 2	Van guards 25
	Servant 1	
Packers 23	Sexton... .. 1	Waiters 13
Packing-case makers 2	Shipwright 1	Waggon lifter 1
Painters 41	Shoeblocks 2	Warder 1
Pantrymen 2	Shop assistants 33	Warehousemen ... 30
Paper hangers 2	Shopkeepers 3	Watchcase maker ... 1
Paper stainer... .. 1	Sign writer 1	Watchmen 4
Paper workers 5	Silk dyer 1	Watermen 5
Pattern maker 1	Silk finisher 1	Weavers 2
Pauper 1	Silversmiths 5	Well sinker 1
Paviors 2	Skin dressers 2	Wheelwrights 5
Pawnbroker 1	Slater... .. 1	Whitewashers 2
Pensioner 1	Slaughterman 1	Window cleaners ... 7
Perfumer 1	Soap makers 3	Wine bottlers... .. 3
Pewter-pot maker ... 1	Soldiers 14	Wire workers... .. 1
Piano tuners 2	Solicitors 3	Wood carvers 9
Piano makers... .. 5	Spring maker 1	Wood finisher 1
Picture-frame makers 3	Stageman 1	
Pipe maker 1	Stall keepers 2	Zinc worker 1

MEDICAL REPORT.

PREFACE TO THE MEDICAL TABLES.

Indices of Medical Cases and of the Post-mortem Register for the year are appended to the Statistical Tables.

The system of classification introduced last year has been continued. The Medical cases (with the exception of those in Radcliffe and Isolation Wards, which are bound together under the name of Radcliffe), are bound and indexed according to the Physician under whose care they were.

Thus of Male Patients :—

Those under	Dr. Church	are bound in	Vol. I.
„ „	Dr. Gee	„ „	II.
„ „	Sir Dyce Duckworth	„ „	III.
„ „	Dr. Hensley	„ „	IV.
„ „	Dr. Lauder Brunton	„ „	V.

The Female cases are similarly numbered, and those under Dr. Champneys are bound in Vol. VI.

Also following the plan introduced in 1895, Alphabetical Indices of Patients' names, and of their diseases and chief symptoms, have been embodied in special volumes, one for Male and one for Female cases. These volumes are kept with the notes of the year.

It may be mentioned that the Tables and Indices which follow are not strictly comparable with each other. In Table I. each case only occurs once under the chief disease or symptom, whereas in the Clinical Index prominent secondary symptoms and special methods of treatment are included. Again, the Post-mortem Index includes records of a number of Patients brought in dead or dying in the Surgery Ward, who, not having been admitted to the Hospital, appear neither in Table I. nor in the Clinical Index.

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Rheumatic Fever ...	71	40	2	1	3	5	8	9	17	14	22	8	16	1	5	2				
Rheumatism ...	15	11					1	2	2	1	1	5	3	1	2					
Gonorrhoeal ...	5	5									1	1	3	1	1					
Osteo-arthritis ...	8	3									1	1	1	1	2	1				
Gout ...	6	3											2	2	2	1				
Osteitis Deformans..	1	1													1					
Rickets ...	5	1																		
Scurvy Rickets ...	2	2																		
Syphilis ...	4	1											1	1						
Tuberculosis ...	20	1	19	1	10	1	2	3	1	1	2	2	1	1	1	1				
Marasmus ...	3	1	1	1	1	1	1	2	1	1	1	1	3	3	2	1				
Anaemia ...	47	6	1	1	6	41	1	2	1	16	19	3	3	1	2	1				
Pernicious ...	4	3																		
Enlarged Spleen ...	3	2																		
Leucocythæmia ...	4	2																		
Lymphadenoma ...	4	1																		
Debility ...	14	3	3	2	1	1	1	1	1	1	5	2	3	3	1					
Graves's Disease ...	8	2									1	4	2	2						
Aciditis ...	1	1									1	1								
Addison's Disease ...	6	4	2	2							3	3	1	1	2	1				
Hæmophilia ...	2	1																		

GENERAL DISEASES.

B.

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.			
	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Spinal Haemorrhage	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tumour	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<i>Peripheral.</i>																						
Neuritis	13	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Diphtheritic Paralysis	15	7	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Sciatica	3	2	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Muscular Atrophy	5	4	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Spasm	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pseudo-hypertrophic Paralysis	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Facial Paralysis	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Anaesthesia	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total	312	146	116	28	22	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	M.	F.	Died.	Died.		Died.		Died.		Died.		Died.		Died.		Died.		Died.		Died.	
				M.	F.	Discharged.	M.	F.	Discharged.	M.	F.	Discharged.	M.	F.	Discharged.	M.	F.	Discharged.	M.	F.	Discharged.	M.	F.
DISEASES OF THE RESPIRATORY SYSTEM.																					
Abscess of Lung	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Asthma	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bronchiectasis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bronchitis, Acute	23	7	13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Plastic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Chronic	28	14	7	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Dyspnoea	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Empyema	43	26	10	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Emphysema	6	5	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Laryngitis	6	2	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lung, Fibrosis of	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Malignant Growth of	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phthisis Pulmonalis	69	28	19	15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pleurisy	37	29	8	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Pleurotic Effusion	63	43	19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pleurodynia	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pulmonary Catarrh	7	7	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pneumonia, Catarrhal	64	33	14	10	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Croupous	181	108	58	12	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Sequelae of	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pyo-Pneumothorax	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pneumothorax	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tuberculosis, Acute Miliary	6	1	1	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

ABSTRACT OF TABLE I.

DISEASES.	Total Number of Cases completed during the Year 1896.	Number of Cases discharged.		Deaths.		Remaining in the Hospital at the end of the Year 1896.
		M.	F.	M.	F.	
GENERAL DISEASES, A ...	299	132	114	26	23	
Do, B ...	291	121	141	27	2	
LOCAL DISEASES—						
Diseases of the Nervous System ...	312	146	116	28	22	
" Circulatory System ...	253	106	69	46	32	
" Respiratory System ...	564	317	160	60	27	
" Digestive System ...	367	145	161	36	25	
" Urinary System ...	147	71	43	23	10	
" Female Generative System	305	...	290	...	15	
" connected with Pregnancy ...	88	...	82	...	6	
" of the Cutaneous System ...	30	16	10	2	2	
CONDITIONS NOT NECESSARILY ASSOCIATED WITH GENERAL OR LOCAL DISEASES—						
POISONS ...	30	19	9	1	1	
	2,686	1,073	1,195	249	169	239
		2,268		418		
		2,686				

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TO THE DISEASES AND CHIEF SYMPTOMS OF PATIENTS DISCHARGED
FROM THE MEDICAL WARDS DURING THE YEAR 1896.

N.B.—The mark (†) signifies that a case terminated fatally; (‡) that a post-mortem examination was made. A copy of the post-mortem notes is in each case added to the Ward notes.

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- Perforation of—107.
- Ulcer of—67, 107, 336.

STOMATITIS—24, 73, 188, 236, 254.

SUPRA-RENAL CAPSULES—

- Lardaceous—238.
- Lymphadenoma of—82.
- Tumour of—45, 197.
- Tubercular Disease of—173.

THROMBOSIS—*See* Veins.

TRACHEA—

- Compression of, by Aneurysm—66, 281, 312.
- by Malignant growth—150.
- Ulceration of, Catarrhal—9, 267.
- Malignant—30.
- from pressure—281, 312.
- Tubercular—97.
- Typhoid—50.
- from Tracheotomy Tube—145.

TRACHEOTOMY—66, 88, 92, 131, 145, 175, 198, 243, 333.

TUBERCLE—

- Of Glands—*See* Lymphatic Glands.
- Of Intestine, small—36, 43, 52, 97, 104, 112, 144, 158, 161, 171, 181, 267, 277, 291, 308, 349, 350, 358.
- Of Intestine, large—52, 97, 102, 112, 264, 267.
- Of Kidney—36, 52, 71, 91, 97, 104, 134, 167, 194, 247, 262, 267, 300, 338, 339, 350.
- Of Larynx—10, 102, 112, 133, 277, 322.
- Of Liver—*See* Liver.
- Of Lungs—*See* Lungs.
- Of Meninges—*See* Meningitis.
- Of Peritoneum—36, 105, 112, 140, 170, 171, 194, 202, 262, 320, 338, 349.
- Of Pleura—36, 52, 72, 97, 104, 134, 140, 194, 202, 249, 320.
- Of Spleen—*See* Spleen.
- Of Supra-renal Capsules—173.
- Of Trachea—97.
- Of Ureters—90.

TYPHOID FEVER—32, 50, 210, 226, 230, 252, 253, 289, 300, 317.

URÆMIA—154, 354.

URETERS—

- Concretions in—315.
- Dilatation of—34, 41, 90, 315.
- Double—39.
- Inflammation of, acute—344.
- Tubercular Disease of—90.

URETHRA, Stricture of—21, 256.

URETHRITIS, acute—31, 344.

UTERINE CERVIX—

- Laceration of—261.
- Ulceration of—106, 123.

UTERUS—

- Enlarged, after Abortion—123, 191, 234, 261.
- Fibroid of—30, 79, 95, 130, 290, 299, 308.
- Retroversion of—114.
- Sub-involution of—78, 106, 153.

UTERINE APPENDAGES—

- Broad Ligament, Cyst of—234.
- Abscess of—106, 114.
- Fallopian Tubes, Abscess of—270.
- Cyst of—29, 79, 130.
- Malignant growth of—130.
- Rupture of—270.

VEINS—

- Thrombosis of, Iliac—250, 276, 308.
- Jugular—247, 250.
- Ovarian—114.
- Portal—18, 27.
- Subclavian—250.
- Superior Mesenteric—324.
- Umbilical Vein (pervious)—135.
- Vena Cava inferior—162, 170, 250, 276.
- Obstruction of, Vena Cava superior—292, 310.



SURGICAL REPORT.

PREFACE TO THE SURGICAL REPORT.

The general arrangement of the Statistical Tables is the same as in previous years.

Table I. comprises all patients who left the surgical wards during the year ; each patient appears in this Table once only ; cases in which two or more injuries or diseases occurred in the same patient are entered only under the principal disease or injury. In the Library is kept a manuscript index in which all injuries and diseases are entered, irrespective of the number of patients. Thus, a patient with fracture of the base of the skull, fracture of the clavicle, and dislocation of the elbow would be entered in Table I. under the first heading only, but in the manuscript index under all three.

Table II. includes all operations upon the patients in Table I., and also operations performed upon patients in the gynæcological and medical wards.

The Appendices have this year again been somewhat enlarged, and a new feature of both of them is the insertion, after the description of each case, of the reference to the volume and number of the notes of the case. The bound volumes of notes are kept in the Library.

TABLE I. (continued).

DISEASE.	Total.		Discharged.		Died.	Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.			
	M.	F.	M.	F.		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
TUMOURS (continued).																									
Epithelioma (continued)—																									
<i>Oesophagus</i> ...	12	...	6	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Palate</i> ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Penis</i> ...	2	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Pharynx</i> ...	4	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Scrotum</i> ...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Temple</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Tongue</i> ...	36	...	29	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Tonsil</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rodent Ulcer—																									
<i>Face</i> ...	10	...	6	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Ear</i> ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Alveolar Carcinoma—																									
<i>Back</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Breast</i> ...	76	...	1	...	75	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Breast (recurrent)</i> ...	16	...	1	...	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Glands of Axilla</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Intestine</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Kidney</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Ovary</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Prostate</i> ...	3	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Rectum</i> ...	32	...	1	...	31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Stomach</i> ...	10	...	3	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Uterus</i> ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE I. (continued).

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	M.	F.	Died.	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.	
				M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE EYE (continued).																					
Cornea and Sclerotic (continued)—																					
Cholesterol in Anterior Chamber	1	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Conical Cornea	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Foreign Body	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Keratitis	25	17	8	...	2	2	4	1	3	2	3	1	3	1	1	1	...	...	...	...	...
Interstitial Keratitis	11	4	7	...	1	1	1	2	...	...	2	2	...	...	...	...	...	...	...	...	...
Onych	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Opacities	10	5	5	...	1	1	...	...	2	1	1	1	1	1	1	...	...	...	...	...	...
Staphyloma	3	2	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ulcer	50	21	29	...	6	7	2	8	3	2	2	1	2	2	2	2	2	2	4	1	...
Xerosis	2	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iris—																					
Coloboma	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iritis	25	10	15	...	1	...	...	...	...	...	5	...	2	3	2	9	1	2	...	...	...
Irido-Cyclitis	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Irido-Diagnosis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kerato-Iritis	4	3	1	...	...	...	...	...	1	...	1	...	...	...	...	2	...	...	...	...	...
Persistent Pupillary Membrane	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Lens—																					
Aphakia	8	2	6	...	...	...	...	...	1	...	1	...	...	...	...	...	1	1	...	...	4
Capsular Opacities	21	9	12	...	1	...	1	...	...	...	...	...	2	2	1	...	2	4	...	...	5

TABLE I. (continued).

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.			
	M.	F.	Died.	Discharged.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Died.	Discharged.
DISEASES OF THE NOSE AND ANTRUM (continued).																						
Nasal Fistula	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rhinolith	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Septum Deviated	11	9	...	...	4	...	1	1	...	...	4	1	...	...	...	...	...	...	...	...	...	...
Stenosis of Anterior Nares	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Syphilitic Destruction	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE LARYNX AND TRACHEA.																						
Abductor Paralysis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laryngismus	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laryngitis—			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Simple	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Syphilitic	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tuberculous	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oedema of Glottis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Stenosis of Larynx	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Old Tracheotomy	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE DUCTLESS GLANDS.																						
Thyroid*			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Spleen—			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Enlargement of...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

* See Tumours.

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
DISEASES OF THE CHEST.																					
Empyema ...	3	2	1	1					2				1								
" (Old) ...	2	2																			
Pleurisy ...	1	1																			
Pneumonia ...	1	1																			
DISEASES OF THE VASCULAR SYSTEM.																					
Arteries—																					
Aneurism—																					
Carotid ...	1	1																			
Dorsalis Pedis ...	1	1																			
Popliteal ...	2	2																			
Profunda Femoris ...	1	1																			
Posterior Tibial ...	1	1																			
Radial ...	2	2																			
Raynaud's Disease ...	2	1																			
Veins—																					
Phlebitis and Thrombosis...	9	2	1	1					2				1								
Varicose Veins ...	43	30			1	1			7	1			4	3							
Venous Cyst of Forearm ...	1	1																			
DISEASES OF THE LYMPHATIC SYSTEM.																					
Glands—																					
Inflamed and Suppurating ...	10	6	4	4	1	1			1	1			2	1							

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE DIGESTIVE SYSTEM (continued).																				
Tonsils—																				
<i>Enlarged.</i>	4	8	...	...	2	1	1	1	...	...	1	1	1	1	...	...	...	...	...	...
<i>Tonsillitis (Acute)</i>	3	2	...	...	...	...	1	1	1	1	...	...	1	1	...	...	...	...	...	...
Salivary Glands—																				
<i>Calculus.</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Fistula.</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Parotitis.</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pharynx—																				
<i>Adenoid Vegetations.</i>	40	28	...	...	10	4	8	5	7	2	...	...	...	...	...	...	...	...	...	...
<i>Foreign Body.</i>	2	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Granular Pharyngitis.</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Stenosis.</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Ulceration.</i>	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Esophagus—																				
<i>Dysphagia.</i>	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Fibrous Stricture.</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Foreign Body.</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Esophageal Pouch(?)</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Stomach—																				
<i>Dilatation.</i>	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Dyspepsia.</i>	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Gastric Ulcer (perforated).</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Hæmatemesis.</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.			
	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
DISEASES OF THE GENITO-URINARY ORGANS.																						
Bladder—																						
<i>Calculus</i> ...	11	10	...	1	...	1	...	1	...	1	...	1	...	2	...	2	...	2	...	1	...	
<i>Cystitis</i> ...	6	6	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	1	...	2	...
<i>Fistula</i> ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
<i>Foreign Body</i> ...	3	2	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...
<i>Tubercle</i> ...	10	8	2	2	...	2	...	2	...	2	...	2	...	2	...	1	...
Kidney—																						
<i>Calculus</i> ...	9	5	4	...	...	...	...	...	...	...	...	...	...	3	...	3	...	1	...	1	...
<i>Hydronephrosis</i>	6	1	3	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
<i>Movable Kidney</i>	7	...	7	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...
<i>Pyonephrosis</i> ...	6	1	3	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	2	...
<i>Renal Fistula</i> ...	2	1	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	1	...
<i>Renal Pain</i> ...	12	6	6	...	...	...	...	...	2	...	2	...	2	...	3	...	3	...	1	...	...
<i>Tubercle</i> ...	2	1	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	1	...
<i>Old Nephrectomy</i>	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	1	...
Prostate—																						
<i>Enlarged</i>	10	9	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Inflamed</i>	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Spermatic Cord—																						
<i>Encysted Hydrocele</i>	3	3	...	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...	...	...
<i>Hæmatocele</i> ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Variocoele</i> ...	40	40	...	...	...	...	...	...	3	...	17	...	18	...	1	...	1	...	1	...	...

TABLE I. (continued).

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
DISEASES OF THE CELLULAR TISSUE.																					
Abscess, Inflammation and Suppuration—																					
Abscess—																					
<i>Abdominal Wall</i>	5	4	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1			
<i>Arm</i>	5	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1			
<i>Axilla</i>	5	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Back</i>	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Breast</i>	27	27	1	1	1	1	1	1	2	2	14	14	1	1	1	1	1	1			
<i>Cheek</i>	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Chest Wall</i>	12	7	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1			
<i>Dental</i>	12	8	1	1	1	1	1	1	1	1	3	2	1	1	2	2	1	1			
<i>Floor of Mouth</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Foot</i>	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Gluteal</i>	3	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Groin</i>	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Iliac</i>	5	3	1	1	1	1	1	1	3	3	1	1	1	1	1	1	1	1			
<i>Ischio-Rectal</i>	20	17	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Labium</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Leg</i>	12	6	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1			
<i>Lumbar</i>	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Multipile</i>	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Neck</i>	52	23	3	3	1	1	1	1	1	1	7	6	6	5	3	2	1	1			
<i>Palm</i>	4	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			
<i>Pelvic</i>	6	1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1			

DISEASE.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	Died.		Died.		Died.		Died.		Died.		Died.		Died.		Died.		Died.		Died.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
DISEASES OF THE CUTA-NEOUS SYSTEM (continued).																					
Corn ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eczema ...	7	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erythema Nodosum ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Furuncle ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Molluscum Contagiosum ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scabies ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scleroderma ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Varicella Gangrenosa ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Xeroderma Pigmentosum ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sinuses ...	19	9	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lupus—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Face ...	20	4	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Perineum ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Upper Extremity ...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lower Extremity ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nails—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ingrowing Toe-nail ...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scars—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Contracted ...	7	2	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nerves involved in ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ulcers—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chronic and Varicose ...	16	11	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Perforating ...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phagedenic ...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE I. (continued).

INJURY.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.		
	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
INJURIES OF THE HEAD AND FACE (continued).																					
Injuries of the Eye—																					
Abrasion of Cornea ...	2	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Burns ...	21	18	...	...	1	...	2	...	4	1	...	4	2	...	2	...	1	...	2	...	...
Contusions ...	7	6	...	...	1	...	1	...	2	1	...	2	1	...	1	...	2	...	1	...	...
Rupture of Globe ...	10	9	...	...	2	...	1	...	1	...	2	1	...	1	...	1	...	1	...	1	...
Wounds ...	17	12	...	...	1	...	3	...	1	2	...	1	1	...	1	...	1	...	1	...	...
Fractures—																					
(Simple)—																					
Skull (Base) ...	23	9	...	...	2	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...
" (Vault) ...	5	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lower Jaw ...	9	7	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Upper Jaw ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Compound)—																					
Skull (without Depression)	10	8	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Skull (with Depression)	6	3	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Skull (punctured through ant. fossa)	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nasal ...	2	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
(Oil)—																					
Skull (Vault) ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Old Injury to Head ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE I. (continued).

INJURY.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.	
	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
INJURIES OF THE NECK.																				
Contusions	2	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..
Wounds— <i>Incised</i>	6	3	1	..	1	..	..	..	1	..	1	..	2	..	..	2	..	..	..	..
Strangulation (by hanging)	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
INJURIES OF THE BACK.																				
Contusions	8	7	1	..	..	..	..	1	..	3	1	..	..	..	1	..	..	..	..	1
Concussion of Spine	2	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Wounds— <i>Incised</i>	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
<i>Punctured</i>	1	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..
Fracture—Dislocation of Spine— <i>Cervical</i>	2	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Old Injury to Spine	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
INJURIES OF THE PELVIS AND GENITALS.																				
Contusions	3	..	3	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1
Wounds— <i>Lacerated</i>	5	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Fractures	3	2	1	..	..	..	..	4	..	..	..	..	1	..	..	..	..	..	..	1
Rupture of Urethra	4	3	1	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..

TABLE I. (continued).

INJURY.	Total.		Under 5.		— 10.		— 15.		— 20.		— 30.		— 40.		— 50.		— 60.		Over 60.			
	Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
INJURIES OF THE LOWER EXTREMITY (continued).																						
Fractures (continued)—																						
(Compound) (continued)—																						
Femur (continued)—																						
Tibia and Fibula	28	4	1	1	2	1	1	1	1	1	1	1	5	7	4	1	1	1	3	1		
Pot's	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tarsus	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Metatarsus	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Toes	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
(Old)—																						
Femur (Neck)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
" (Shaft)	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Patella	5	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tibia	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tibia and Fibula	5	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pot's	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
(Dislocations)—																						
(Simple)—																						
Hip	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Semilunar Cartilage	5	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Subastragaloid	3	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Astragalus	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Old Injury to Knee	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Trivial Cases Unclassified	30	16	14	14	3	2	1	1	2	5	2	1	3	1	3	1	3	1	3	1	3	1

ABSTRACT OF TABLE I.,

With Average Duration of Surgical Patients in the Hospital.

Discharged, Cured or Relieved	...	...	...	...	...	...	...	...	$\left. \begin{array}{l} \text{M. 2,415} \\ \text{F. 1,538} \end{array} \right\}$	3,953
Died	...	...	...	...	...	...	...	...	$\left. \begin{array}{l} \text{M. 139} \\ \text{F. 83} \end{array} \right\}$	222
*Remaining in, December 31st, 1896 :—										
Female	...	...	...	...	...	...	...	...	115	} 286
Male	...	...	...	...	...	...	...	...	171	
Average stay of Men	...	...	...	...	...	...	...	...	21.18	days
,,	Women...	...	...	...	...	...	...	...	20.82	,,
* These cases are not included in Table I. or II.										

APPENDIX TO TABLE I.

In this Appendix, reference is made only to cases in which no operation was performed; operation cases are described separately in the Appendix to Table II. All fatal cases and most of the more important of the other cases are described in one or other of these two Appendices.

GENERAL DISEASES.

Anthrax.

A washer of horse-hair, aged 13, was admitted with what was supposed to be an unusual form of anthrax. On the day before admission, a small vesicle appeared just above the right clavicle; on admission the boy looked ill, and had a raised temperature. The vesicle was surrounded by a ring of induration, which rapidly increased, until, on the day after admission, it involved an area some six inches in diameter. The central part became black, and was surrounded by other vesicles. Cultivations from the fluid of the vesicles showed streptococci and staphylococci, but no anthrax bacilli. On the third day after admission, a 1 in 5 emulsion of carbolic acid was injected into various parts of the swelling, which afterwards gradually subsided, the central part coming away as a large slough. The resulting ulcer granulated up and was almost healed when the patient left the hospital on the fifty-second day after admission. The temperature was normal after the fifth day. (ii. 2942.)

Erysipelas. (See separate table.)

Gangrene.

A feeble old woman of 67, was admitted with senile gangrene of the right foot, of two months' duration. The toes were black and shrivelled, the rest of the foot of a dull red colour, the leg above being apparently quite natural. The urine contained a trace of albumen, but no sugar. The gangrene did not spread appreciably. On the fifth day after admission, the patient died quite suddenly. The post-mortem showed thrombosis of the superior mesenteric artery, the lower half of the small intestine being on the verge of gangrene. There was thrombosis of the right femoral and popliteal arteries, but not of the tibials. The arteries generally were slightly atheromatous. (i. 2782.)

A woman, aged 68, was admitted with dry gangrene of the toe. For eight months she had had vomiting after food, and had been losing flesh. Five weeks before admission, in cutting her nails she had wounded a toe, and this had become gangrenous shortly afterwards. The patient was very thin and ill. The toe had nearly separated when the patient died of asthenia. The post-mortem showed much atheroma of the tibial arteries, and a carcinomatous ulcer of the stomach as large as the palm of the hand. (v. 1092.)

A feeble little girl, aged 6, was admitted very ill with tuberculous glands of the neck and ulceration about the mouth. She died a month after admission, and at the post-mortem, the whole of one tonsil and the neighbouring parts were found to be in a sloughing condition. There was no history of any recent exanthem. (v. 1960.)

A man, aged 65, was admitted with diabetic gangrene of the toes. Three years ago he had had gangrene of the toes of the right foot and had recovered. Four months before admission the toes of the left foot became similarly affected; he had lately been much troubled with thirst. He was admitted with dry gangrene of two toes and a good deal of inflammation of the rest of the foot. Urine 1040, containing much sugar. The gangrene spread rapidly, and the patient died on the eleventh day after admission. The post-mortem showed calcification and occlusion of the tibial arteries of both legs. (i. 2665.)

A cabman, aged 62, was admitted in a dying condition with gangrene of the leg. Seven days previously he had grazed his shin in getting off his cab, and three days later the leg became inflamed, then his breathing became bad, and on the day of admission a patch of blackness was noticed on the leg. Patient was a very unhealthy man, fat and sodden with alcohol. The right leg from the toes to the knee was greatly swollen, red and brawny, and in the middle of the leg was a patch of gangrene. The general condition was too bad to justify any amputation, and the patient died on the day after admission. The post-mortem showed general unsoundness of viscera and atheroma of the aorta, but not of the arteries of the limbs. (iii. 3342.)

Two male patients, aged 13 and 19, with dry gangrene of the finger, following injury, made good recoveries. (ii. 1092, iv. 1578.)

Hæmophilia.

Of the six patients admitted for hæmophilia, one was a telegraphist, aged 48, who had an extensive spontaneous subcutaneous hæmorrhage about the chest; since the age of 10 he had frequently bled from various parts of the body. (iv. 785.)

Three patients were admitted for hæmorrhage, after wounds of the axilla and hand, and after tooth extraction. Two were admitted for hæmorrhage into and around the knee joint. One of the latter was the same patient who was in the hospital in 1894, and who nearly died of hæmorrhage from a wound of the thigh. (See Surgical Report for that year, p. 101.) (v. 3025.)

All six made good recoveries.

Septicæmia and Pyæmia. (See separate table.)

Tetanus.

Two male patients were admitted for subacute traumatic tetanus, and were treated with antitoxin, with a successful result. One of them also underwent amputation of the forearm, and his case is therefore described in the Appendix to Table II. (p. 168).

The other was a glassblower, aged 15. Twenty-seven days before admission, a piece of iron fell on his great toe. Twenty-five days later, the toe nail was removed at another hospital without an anæsthetic and without causing any bleeding. The same day the patient became "stiff," and remained so until admission. On admission, there was slight rigidity of the legs and a slight, but distinct risus sardonicus. The toe was quite healed, and showed no signs of inflammation. In the first twelve hours the boy had eleven mild spasms, and slight opisthotonos; on the day after admission he was given $\frac{1}{2}$ gramme of Tizzoni's tetanus antitoxin; next day eight spasms, $\frac{1}{2}$ gramme of antitoxin

given twice ; on the third day one spasm, 1 gramme of antitoxin ; on the fourth day seven spasms, more severe ; $\frac{1}{2}$ gramme antitoxin ; on the next two days a few mild spasms, $\frac{1}{2}$ gramme given each day ; then the antitoxin treatment was discontinued ; there were a few more very mild spasms for the next three days, then the patient made a complete recovery. Chloral and bromide of potassium were also given on several occasions. The value of the antitoxin in this case was considered somewhat doubtful ; certainly the worst spasms followed the largest dose of antitoxin. (v. 1942.)

VENEREAL DISEASES.

A male infant, aged 20 months, with congenital syphilis, died of vomiting and asthenia on the ninth day after admission ; there was no post-mortem. (iii. 3196.)

TUMOURS.

Carcinoma.

BLADDER.—Of five patients admitted for carcinoma of the bladder, four underwent no operation.

A woman, aged 54, had had for eight years occasional pain and frequency of micturition ; there had been much blood and pus in the urine ; on examination with the cystoscope, a malignant growth was seen in the bladder. The patient left the hospital without operation. (iii. 1267.)

A gasfitter, aged 58, had had for four months dysuria and occasional retention, but no hæmaturia ; on admission he was thin and ill, and had some œdema of the left leg ; the prostate was large and hard, the passage of a catheter difficult, the urine was turbid and bloodstained. The catheter had to be passed daily, the œdema subsided, but the patient rapidly sank and died on the nineteenth day. At the post-mortem, a very firm warty epitheliomatous growth was found to involve the whole of the trigone, and to infiltrate also the prostate and neighbouring parts of the bladder wall ; there was no visible ulceration ; the lumbar and iliac glands were much infiltrated with new growth, and the left external iliac vein was thrombosed, the growth having extended directly into it from the bladder. (v. 3020.)

The other two cases were men, aged 46 and 47, who were in the hospital only a few days, being unsuitable for treatment. (v. 1050, v. 1754.)

LARYNX.—A potman, aged 44, was admitted with epithelioma of the larynx and œdema glottidis ; the latter soon subsided, and patient left the hospital without further treatment. (v. 2436.)

An engineer, from whose vocal cord an epithelioma had been removed twenty-two months previously, and upon whom tracheotomy had been performed six months later, was readmitted with extensive recurrence ; no further operation was possible, and he died nine days after admission of dyspnoea, pneumonia and exhaustion. At the post-mortem, the growth was found to have caused a fistulous opening between the trachea and œsophagus. (v. 1667.)

A man, aged 42, was readmitted with an extensive epithelioma of the larynx and root of the tongue, and died of pneumonia a few days later, fourteen months after the first symptoms of the disease ; tracheotomy had been performed seven months before death. The post-mortem showed that there were no secondary growths. (v. 2288.)

ŒSOPHAGUS.—Of twelve patients admitted for epithelioma of the œsophagus, four were treated by operation (gastrostomy or œsophagotomy), eight without ; of the former all, of the latter two, died in the hospital.

A plumber, aged 60, was admitted with a history of three months' dysphagia and wasting, and three weeks' dysphonia; nothing could be passed through the stricture, but the patient could swallow liquids. He gradually sank and died forty-three days after admission; the post-mortem showed an epithelioma of the upper part of the œsophagus and a large gangrenous cavity at the apex of the right lung; there were secondary growths in the liver. (iv. 721.)

A miller, aged only 28, was admitted on account of cough, emaciation and difficulty in swallowing. Eight years ago he had first had dysphagia, and he had had attacks from time to time ever since; two years ago he had been in another hospital for the same complaint, and bougies had been passed; six months ago he began to lose flesh, and for five weeks he had had cough and some hæmoptysis. On admission he was much emaciated and looked very ill. A large bougie could be passed into the stomach without any difficulty. The larynx was normal, and nothing was found in the chest except a little pleurisy, thought to be probably tuberculous. The temperature, at first about 100°, began to rise considerably at the end of the week. Dyspnoea set in, and the patient rapidly grew worse, dying on the eleventh day after admission. While in the hospital he was able to swallow meat and other solid food, although slowly and with some difficulty. At the post-mortem, an extensive epitheliomatous ulcer was found to involve the middle third of the œsophagus; the wall of the œsophagus was much infiltrated by the growth, which had extended into the pleura and set up a fatal septic pleurisy. There was some dilatation of the œsophagus, but no stricture; the nature of the growth was confirmed by microscopic examination, which showed typical squamous epithelioma. (iv. 2840.)

A potman, aged 45, was admitted with a large mass of growth in the neck and little dysphagia; he stayed in the hospital only a few days, no surgical treatment being considered advisable. (iv. 1495.) The other five patients who left the hospital without operation were men aged 49, 49, 50, 55, and 65. (iv. 2786, v. 3738*, v. 1085, iv. 54, v. 1393.)

PHARYNX.—A man, aged 50, was admitted with an extensive epithelioma of the pharynx and base of the tongue; symptoms had existed for six months. No operation was possible, and the patient gradually sank and died of pneumonia on the twenty-fifth day after admission. The post-mortem showed that he had also an aortic aneurism, three inches in diameter, springing from the second part of the arch, compressing and displacing the trachea, and quite full of clot. It had produced no symptoms and had evidently undergone complete spontaneous cure. There was also evidence of a very old rupture of the liver and fracture of many ribs, complete recovery from these injuries having occurred. (iv. 2865.)

TONGUE.—Of thirty-six men and four women admitted for cancer of the tongue, nine men and two women left the hospital without operation, the disease being too extensive for removal; one woman refused operation; upon one man division of the lingual nerves was performed, and upon the remaining twenty-three removal of the tumour was performed.

TONSIL.—A dairymaid, aged 55, who had had sore throat for three months and swelling at the angle of the jaw for two months, was admitted with an epithelioma of the tonsil and tongue; she refused operation and left the hospital. (v. 2877*.)

BREAST.—Of seventy-six patients admitted for cancer of the breast, nine were not suitable for operation, and one refused operation; all these left the hospital a few days after admission.

Of sixteen patients admitted for recurrence after removal of cancer of the breast, four women and one man underwent no further operation. One woman, aged 47, died in the hospital three weeks after admission; the primary operation (removal of breast and axillary glands) had taken place eleven months previously; recurrence took place in skin, glands and liver (iii. 545).

A woman, aged 50, who had had one breast and the axillary glands on both sides removed three years previously (v. 1163) ; a woman, aged 72, whose breast and glands had been removed sixteen months previously, and whose tumour had existed twelve months before that (iv. 502) ; a woman, aged 68, whose breast and glands had been removed six months previously, and whose tumour had existed three months before that (i. 1931) ; all these three were unsuitable for further operation and left the hospital within a few days of admission. The man was the patient, aged 41, mentioned on page 173 ; extensive recurrence took place in the skin and cervical glands within eleven weeks of the first operation. (iv. 555.)

OVARY.—A woman, aged 46, was admitted with chronic peritonitis, the cause of which was believed to be malignant disease, and died 15 days after admission. The duration of abdominal symptoms was six months. At the post-mortem it was found that both ovaries were the seat of carcinomatous growths. One of them had extended into the rectum ; peritonitis had thus been set up and a large intra-abdominal abscess slowly formed ; this eventually burst into the general peritoneal cavity, causing fatal septic peritonitis (i. 2189).

PROSTATE.—Of three patients admitted for carcinoma of the prostate, two died ; one was a labourer, aged 74, who had had dysuria and hæmaturia for four years ; he died on the fifth day after admission ; the post-mortem showed an extensive warty growth of the prostate and trigone (ii. 1996). A stevedore, aged 51, with symptoms of eighteen months duration, was discharged without operation. The third case underwent supra pubic cystotomy.

RECTUM.—Of thirty-two patients admitted for carcinoma of the rectum, seven men and three women were discharged a few days after admission without having undergone any operation ; three men and one woman underwent excision, one man dying ; eleven men and six women underwent inguinal colotomy, all recovering. There was also a thirty-third case of a woman, who was in a medical ward (not in the statistics of Table I), who underwent inguinal colotomy with a fatal result.

STOMACH.—Five male and five female patients were admitted with carcinoma of the stomach ; of these, one man underwent gastro-enterostomy, one woman pylorotomy and enterectomy, both died ; a man recovered after an exploratory abdominal section. The others underwent no operation ; a man, aged 52, with a pyloric tumour and a history of nine months' vomiting, and a woman, aged 43, with a pyloric tumour as large as a hen's egg and a history of thirteen months' symptoms of pyloric obstruction, both refused gastro-enterostomy and left the hospital. A sweep, aged 54, upon whom gastro-jejunostomy had been performed four months previously at another hospital was in the hospital for a few days only ; he appeared to be in excellent health. (v. 1698.)

Two women, both aged 38, with carcinoma of the pylorus, left the hospital without operation.

A married woman, aged 49, who had suffered for six months from loss of flesh and pain and vomiting after food, was admitted with a tumour in the region of the pylorus. She was relieved by washing out the stomach, but gradually became weaker and died three months after admission. The post-mortem showed a large mass of pyloric carcinoma and some foetid pus in the right pleura. (v. 1257.)

A beerbottler, aged 59, was admitted for an extremely hard lump in the situation of a right inguinal hernia. The patient had lost much flesh lately and was very ill ; examination of the abdomen showed malignant disease of the peritoneum, and viscera, and of this the patient died on the tenth day after admission. At the post-mortem, the primary disease was found to be in the stomach, which was extensively infiltrated with carcinoma. The peritoneum and liver were extensively involved. The lump in the groin consisted of omentum infiltrated with new growth. (iii. 2736.)

An eleventh case of carcinoma of the stomach is recorded in the statistical tables and appendix under gangrene of the toe, for which she was admitted. (v. 1092.)

Sarcoma.

ANUS.—A female child, aged 3, was admitted with a hard warty sarcomatous growth as large as a Tangerine orange all round the anus and extending up into the rectum. It had begun to grow at the age of six months, and had been removed three times at other hospitals. There were large hard glands in the groin. The growth involved the rectum so extensively that no operation was thought to be advisable. (v. 1498.)

FEMUR.—An engine driver, with a very large sarcoma of the upper end of the femur of eighteen months' growth, refused amputation and left the hospital. (iii. 59.)

A girl, aged 19, with a periosteal sarcoma of the lower end of the femur of four months' duration also refused amputation. (v. 1949.)

Two other cases recovered after amputation.

HUMERUS.—Of three patients admitted for sarcoma of this bone one made an excellent recovery after amputation at the shoulder. (v. 3483); a man, aged 58, with a sarcoma of the upper end of two months' duration, was too bad for any operation, and left the hospital in a few days (i. 91); both these were cases of periosteal sarcoma. A plasterer, aged 55, admitted with a large tumour of the shoulder, a spontaneous fracture of the humerus and a history of two years' pain and swelling, refused operation; the tumour was believed to be a myeloid sarcoma. (iv. 1752.)

PETROUS BONE.—A traveller, aged 36, had had discharge from the right ear for nearly thirty years; for five months he had had severe pain in this ear and side of the head; for four months there had been bleeding from this ear, and some swelling; for three months he had had partial facial paralysis. On admission there was paralysis of right facial and hypoglossal nerves; no vomiting, no optic neuritis, no temperature, but much brawny swelling about the ear and mastoid process, and some hard enlargement of cervical glands. The disease was considered to be sarcoma of the petrous bone and unfit for operative treatment: the patient left the hospital forty-seven days after admission; after he had left the hospital, an incision was elsewhere made into the swelling, and the diagnosis was confirmed; the patient was reported to have died of the disease four weeks later. The case was one of much interest, as in the earlier stages of the disease the resemblance to an inflammatory affection was very great. (iv. 3501*.)

PUBIS.—A labourer, aged 18, had complained for one month of pain and stiffness about the neck, and when first admitted was thought to have caries of the spine; he had partial paralysis of both arms and increased patella reflexes; there was some tenderness about the neck, but little pain; he was kept at rest in bed. Fifteen days after admission severe headache set in, two days later a number of small subcutaneous nodules under the skin of the abdomen were first noticed; then facial paralysis and dysphagia set in, and he died on the twentieth day after admission. The post-mortem showed a primary sarcomatous growth in the pubis, with secondary growths in the fifth cervical and third lumbar vertebræ and in nearly every viscus of the chest and abdomen. (i. 1381.)

MUSCLE.—Three cases were treated by operation; the fourth was a woman, aged 48, who was admitted with a large fixed sarcomatous mass in the groin; a swelling had been present for six years, but it had grown rapidly in the last six months. Operation being out of the question, the patient was treated with a mixture of streptococcus erysipelatosus and bacillus prodigiosus, which was injected frequently for about two months. No improvement, however, took

place ; the tumour grew steadily, fungated, bled, and eventually bursting in the peritoneal cavity, set up peritonitis, which ended fatally seven months after admission. (v. 1920*.)

LYMPHOSARCOMA OF NECK.—A carpenter, aged 27, was admitted with a sarcomatous tumour of the neck of two years' duration. Nine months previously, some enlarged glands had been removed from the same site at another hospital, and pronounced to be tuberculous. Since that time the tumour had slowly increased in size, and on admission was a large fixed mass, quite unfit for operation. The patient gradually sank, and died six weeks later. At the post-mortem, the whole of the right anterior triangle of the neck and most of the posterior were occupied by a firm mass of sarcoma fixed to the clavicle and sternum, and displacing the larynx, trachea and thyroid gland ; the sterno-mastoid was largely replaced by growth, and the skin widely involved, although nowhere ulcerated. The main growth was homogeneous and singularly devoid of the lobulation usually seen in lymphosarcoma of the neck. In the mediastinum, however, and in one axilla, were a few isolated glands affected with the same disease. There was no ulceration of mucous membrane anywhere.

The other four cases of lymphosarcoma were ordinary cases ; two of them were submitted to operation. (v. 2489.)

Cysts.

CONGENITAL SACRAL.—A labourer, aged 55, was admitted with a tumour nearly as large as a man's head, situated over the sacrum and coccyx. It had existed since birth, but in the last seven or eight years it had grown more rapidly. For two years the glands in both groins had enlarged ; they were very large and hard. The case was considered to be one of malignant disease engrafted upon a congenital sacral cyst ; no operation was deemed advisable. (i. 3282.)

Granuloma.

A woman, aged 50, who had suffered from myxœdema for three years, was admitted on account of several large prominent granulomata on the front of both legs ; the largest was about two inches in diameter. They had been present ten months. A similar growth which had existed six years had been removed a year ago at another hospital. Patient discharged herself a few days after admission and went to another hospital, where the growths were removed, and when examined microscopically, these were found to be inflammatory and apparently tuberculous. (v. 2914*.)

Of eleven patients admitted for **bronchocele**, three underwent no operations, in seven cases enucleation was performed, and in one case extirpation.

MALFORMATIONS AND DEFORMITIES.

Cleft Palate.

Sixteen male and four female patients were admitted ; of these, two males and one female underwent no operation. In seven male cases, the deformity was complicated with harelip ; in eight male and four female cases there was no harelip ; one male case was traumatic, not congenital.

Congenital Malformation of Hand.—A man, aged 27, was admitted with congenital deformity of both hands and recent cellulitis of one arm. The right hand had four rudimentary fingers without nails and a small thumb with a nail. The metacarpal and carpal regions were represented by a huge soft mass, looking not unlike a boxing glove, and thirteen inches in circumference ;

above this, in the lower third of the forearm, a deep and well-marked constriction. In the left hand, the little finger and thumb were normal, the other three fingers contained one small bone each, covered by a rounded lump of soft tissues. With this left hand, patient could dress and undress himself, pick up pins, feed himself and write. The cellulitis soon subsided, and patient left hospital, no operation being deemed advisable. (ii. 2937.)

Hammer toe.—Of twenty cases, nine were treated by amputation, nine by excision of the head of the phalanx, one by division of the lateral ligaments, and upon one no operation at all was performed.

Harelip.—Seven male and three female patients were admitted; plastic operations were performed upon all. In four male and three females, the malformation was complicated with cleft palate; in three male cases there was no cleft palate.

Imperforate rectum.—An infant, aged 3 days, was admitted with an imperforate rectum, and died three days later. At the post-mortem, the rectum was found to end blindly opposite the lower end of the sacrum; there was a well-marked anal cul de sac and a fistulous opening between the vagina and the upper part of the rectum. There was also congenital malformation of the heart. No operation was performed.

Spina bifida.—Of five cases, one was successfully treated by operation; two left the hospital a few days after admission; one of these was in good health (iv. 786), one had suppuration of the sac and increasing hydrocephalus (v. 2347); two died; one was aged 2 days, and the sac had burst at birth; hydrocephalus and septic spinal meningitis were present on admission, and of these, the child died three weeks later. (iii. 749.) In the fifth case, the child was aged 12 days: the sac was already ulcerated, and death occurred a month after admission from suppurative spinal meningitis and hydrocephalus. (v. 2660.)

Cerebral abscess.—There were seven cases of cerebral abscess in the surgical wards during the year, one (male, v. 2484), was transferred to a medical ward, where he died (recorded in the Medical Statistics); in one case the abscess complicated compound fracture of the skull (*q.r.*): in two male and three female cases the abscess was a complication of otitis media; three of these cases appear in the Statistical Tables under this heading, two of these, as well as the remaining two, are described under trephining (v. 1368F., v. 1843M.); the fifth case was not trephined, and is fully described in the appendix under otitis media.

Cerebral hæmorrhage.—A miner, aged 27, when intoxicated, fell from an omnibus on to his head; after spending a night in a police cell, he was admitted to the hospital in a drowsy, dazed condition with aphasia, right facial paralysis and paralysis of the right arm and leg; there was a small hæmatoma of the right temple. The case was supposed to be one of traumatic cortical hæmorrhage on the left side. The symptoms gradually subsided, and the patient left the hospital on the thirty-second day after admission quite well in every respect, except that there was a slight trace of weakness in the right leg. (v. 2662.)

Meningitis.—A female child, aged 23 months, was admitted with symptoms of general meningitis, believed to be tuberculous. It was stated to have been quite well until the previous day, when it fell down some steps on to its head. About twelve hours after the accident it began to vomit and became drowsy. The child grew rapidly worse, and died on the day after admission. The post-mortem showed general tuberculous meningitis, but no signs of injury. There was some tubercle also at the apex of one lung. (ii. 2523.)

A boy, aged 8 months, with an abscess of the foot, died of tuberculous meningitis, ten days after admission. (iii. 662.)

A boy, aged 4, who had recently been in the hospital with multiple tuberculous abscesses, was re-admitted with tuberculous meningitis, and died nine days later. (v. 389.)

DISEASES OF THE EYE

The only death during the year was that of a girl, aged 16, who died of tuberculous meningitis after removal of the eye-ball for tubercle of the choroid. (Ophthalmic Register, No. 507.)

DISEASES OF THE EAR.

Of fifty-seven patients admitted for OTITIS MEDIA, nineteen males and eighteen females recovered without any operation other than the opening of a mastoid abscess, or some similar small local operation. Five males and six females made good recoveries after trephining or erosion of the mastoid; in the case of three male patients, the lateral sinus was trephined, and the internal jugular vein tied; one of these recovered. Two female patients recovered after trephining the skull for cerebral abscess, and one male patient after trephining and evacuation of a large extradural abscess (for all these see Appendix II.)

The three following cases underwent no large operation :—

A feeble, ill-nourished female child, aged 6 months, was admitted with cellulitis of the neck, and a mastoid abscess; the latter was opened, but the cellulitis spread down the neck, and the child died on the fourth day after admission. At the post-mortem, the cellulitis was found to have extended into the chest; there was no meningitis or thrombosis of the jugular vein. (iv. 767.)

A boy, aged 6, who had had otorrhœa ever since scarlet fever two years ago, had been acutely ill for a week; for one day he had had vomiting and severe pain in the head, and had been very irritable. He was admitted semi-conscious and in a dying condition; he died one hour afterwards. The post-mortem showed much basal meningitis, and suppurative thrombosis of the lateral sinus. (i. 2500.)

A boy, aged 7, was admitted for otitis media and mastoid abscess; for two years he had had otorrhœa; twelve days before admission he became ill, and a swelling subsequently appeared behind the right ear. On admission there was a mastoid abscess, and some tenderness down the right side of the neck. Temperature 103°. No optic neuritis. The abscess was opened immediately; the patient was irritable and semi-conscious; his condition gradually became worse; on the tenth day after admission he had his first and only rigor; on the fourteenth day, slight optic neuritis was first noticed, and there was retraction of the head. On the sixteenth day he died. The tenderness in the neck had never been very marked. Throughout his stay in the hospital his temperature had been between 101° and 103°, the pulse never below 112, respiration never below 30. The post-mortem showed a large cerebellar abscess on the right side; the lateral sinus and internal jugular vein were thrombosed as far as the subclavian; there was some localised suppurative meningitis, and there were numerous infarcts in the lung. (v. 260.)

A case not included in the surgical statistics, is that of a girl, aged 13, who was admitted very ill with otitis media; she was seen by the physicians considered to have typhoid fever, and transferred to a medical ward, where she died; at the post-mortem, there was no typhoid, the symptoms having been due to septicæmia supervening upon middle ear disease. (Fem. Surg. Register, iv. 2768.) (See Medical Statistics.)

For other cases of ear disease not comprised in the above statistics, see nervous system (cerebral abscess), polypus of ear, sarcoma of petrous bone, &c.

DISEASES OF THE DUCTLESS GLANDS.

Thyroid.

A case of myxœdema has been described under *granuloma fungoides*, for which she was admitted. (v. 2914.)

The other thyroid cases are described under tumours (innocent and malignant).

Spleen.

A labourer, aged 22, admitted very ill with a large abdominal swelling, was found to be suffering from leucæmia; he got rapidly worse, and died three days after admission; there was no post-mortem. (i. 2323.)

DISEASES OF THE CHEST.

A woman, aged 34, was admitted moribund with an empyema, and died a few minutes later, before any treatment could be adopted, or any thorough examination made. There was no post-mortem. (v. 1306.)

DISEASES OF THE VASCULAR SYSTEM.

Arteries.

ANEURISM.—A station-master, aged 50, admitted with aneurism of the aorta of sixteen months' duration, was transferred to a medical ward, and died there three days later, the aneurism bursting into the trachea. (v. 527 and Medical Statistics.)

A carman, aged 28, was admitted very ill with double aortic disease and a swelling in Scarpa's triangle; the latter had existed eight weeks, and was deep-seated, ill-defined, hot and tender; the femoral artery could be felt running over it. An incision was made into it, and some dark blood and clot turned out. There was very little hæmorrhage, and no large artery was tied. With the exception of a small sinus, the wound healed well, but the patient died from cardiac dyspnoea on the sixty-third day after admission. At the post-mortem, an aneurism as large as a walnut was found near the end of the profunda artery, surrounded by much old inflammatory tissue. The opening from the artery had become occluded. (v. 1130.)

A man, aged 48, whose artery had been tied for popliteal aneurism ten years previously in this hospital, was re-admitted for a few days, and then transferred to the medical side, on account of aortic disease. The aneurism had been completely cured. (i. 1126 and Medical Statistics.)

Veins.

THROMBOSIS.—A plasterer, aged 47, was admitted delirious and very ill, with an abscess in the neck of eight days' duration. There was considerable swelling and congestion of the right orbit. The abscess was opened, but the patient gradually became more and more unconscious, and died on the thirteenth day after admission. At the post-mortem, the abscess was found to be directly connected with suppurative thrombosis of the internal jugular vein. There was ulcerative endocarditis and suppurative panophthalmitis. (ii. 1618.)

DISEASES OF THE DIGESTIVE SYSTEM.

Mouth.

HYPERTROPHY OF GUMS (DIFFUSE EPULIS).—A boy, aged 6, was admitted with this disease. The condition had been noticed in early infancy, and had been gradually getting worse. The gums of both upper and lower jaws were

occupied by a moderately firm vascular growth, surrounding and partly overlapping the teeth. There was no tendency to bleed, and the boy was otherwise in good health. The most prominent part of the growth that was distorting the upper lip was shaved away with a good result. (iv. 3208.)

STOMATITIS.—A male infant, aged $1\frac{1}{2}$ years, was admitted very ill with ulcerative stomatitis, and died shortly afterwards. (iv. 3109.)

NIGRITIES LINGUÆ.—The only case was that of a cabinet-maker, aged 68, who had first noticed blackness of the tongue three weeks before admission. Far back in the middle line of the dorsum of the tongue was an oval patch, perfectly black, slightly raised and composed of numerous long filiform processes. It caused no trouble and was not interfered with. (iii. 1657.)

Esophagus.

DYSPHAGIA.—A brewer, aged 43, was admitted for increasing dysphagia ; it had existed twelve months ; a full-sized bougie could be passed with ease into the stomach ; it was considered that the case was probably a case of thoracic aneurism, although no definite evidence of this could be found. (ii. 3549*.)

FIBROUS STRICTURE.—A boy, aged 2, had swallowed some hydrochloric acid five months before admission, and had been unable to take any solid food since. He was admitted in a very miserable condition and much emaciated. A catgut bougie was passed with difficulty, bougies were then passed at intervals, the child gained considerably in weight and general condition and left the hospital five months after admission. A large bougie could then be passed. (i. 3796*.)

Gall Bladder.

DILATATION.—A corn dealer, aged 54, had been quite well until eight weeks ago, since then he had had jaundice steadily increasing, the liver was enlarged, the gall bladder much dilated, and the patient very ill. The diagnosis was carcinoma, and no operation was deemed advisable. (v. 1827.)

PERFORATION.—A woman, aged 66, was admitted in a state of collapse with acute general peritonitis and died in a few hours. The history was that for many years she had been subject to attacks of jaundice and slight abdominal pain. Three days before admission a much more severe attack occurred, with vomiting. No operation was deemed advisable. At the post-mortem, the gall bladder and all the bile ducts were greatly distended and contained numerous calculi. At the fundus the gall bladder had given way, thus setting up general peritonitis. (iv. 1372.)

Intestines.

HERNIA.—The number of patients (138) admitted for reducible hernia is slightly less than in the preceding year (141). The cases of irreducible hernia (30) show a similar decrease (36 last year). The number of strangulated hernias (41) is slightly less than those of any of the three preceding years (46, 45 and 47).

There was only one death among the 168 cases of reducible and irreducible (non-strangulated) hernia. (See Appendix II.)

Twenty-four patients were admitted for strangulated inguinal hernia ; in seventeen cases the hernia was reduced by taxis ; in seven, herniotomy was necessary ; all recovered.

A man, aged 31, was admitted with a sinus in each groin, the result of an operation for radical cure, done at another hospital seven months previously. The wounds had healed after the operation, but broke down subsequently. The sinuses healed after the removal of some stitches. (v. 579.)

INTESTINAL OBSTRUCTION.—Of five cases of acute intestinal obstruction, all died, three after operation, two without.

A woman, aged 54, was admitted very ill with ill-defined symptoms of intestinal obstruction. Eleven years ago she had had an attack of peritonitis, and a lump had then been noticed in the abdomen; it subsequently disappeared, and the patient was in fairly good health, although habitually constipated, until nine days before admission, when she began to vomit; constipation from that time was absolute. On admission patient was ill; a consultation was held, but, as there was no distension of the abdomen, and a hard mass could be felt in the region of the cæcum, it was felt that no operation could benefit her; she died on the fourth day. At the post-mortem, it was found that an old subperitoneal fibroid as large as a hen's egg, and with a very narrow pedicle one-inch long, had been twisted some years previously, and had set up local peritonitis; this had led to adhesions, which had caused incomplete strangulation of the intestine, at a point five feet above the valve. There was so much matting together of the parts, that an operation to relieve the strangulation would have been practically impossible. (iv. 2437.)

A labourer, aged 59, was apparently in good health until ten days before admission; since that date absolute constipation and frequent vomiting, not fecal, had set in. He was admitted in a drowsy state, with cold skin and moderately distended abdomen; he was too ill to stand any operation, and died on the second day. Post-mortem, the whole small intestine, with the exception of a few inches at each end, was found encircled and partially strangulated by a remarkable congenital fold of peritoneum. There was no peritonitis. (iii. 1477.) (See also Museum drawing 3614.)

APPENDICITIS.—There was a great increase in the number of these cases (50) compared with that of the preceding year (15).

Six cases were MILD ones, and the patients recovered quickly without external suppuration and without operation; one of these was a boy, aged 19, who had been in the hospital five times already, and had had his appendix removed; he was re-admitted with a fresh attack of pain in the same region, which, however, quickly subsided. (Male ii. 305, 3756, iii. 2762, 3840*, iv. 3728*, Female 2911*.)

Thirteen were CHRONIC RELAPSING cases without external suppuration. Of these, eight (Male i. 2633, 3600*, iv. 3428*, 3740*, v. 3248, Female ii. 728, iv. 2064, 2806*) were treated by removal of the appendix in a quiet interval; all recovered; the other five recovered without any operation; a coachman, aged 23, admitted in a second attack, accompanied by pain, vomiting and distension; under an anæsthetic a lump in iliac fossa could be felt; after a consultation, it was decided not to operate; the man rapidly recovered, and left the hospital sixteen days later, apparently quite well (ii. 1062); a boy, aged 18, who had had several attacks in the last six months, had no acute symptoms during the month he stayed in the hospital (ii. 3); a student, aged 21, with a third attack (iii. 3747*); a farrier, aged 34, who had had several attacks in the last three months, a tender swelling in the iliac region soon disappeared with rest in bed (v. 1794); a woman, aged 25, with similar symptoms, had had several attacks in the last twelve months (ii. 1206). All these also recovered.

There were twenty-four ACUTE cases accompanied by suppuration; all these were submitted to operation of one kind or another, and twelve died.

Of these twenty-four cases, six were treated by free incision into the peritoneal cavity, removal of appendix, washing out of the abdomen, and drainage. (Male ii. 1022, v. 459, 2291, 2850; Female ii. 713, iii. 2260); of these, four died.

Three cases (Male ii. 1896, iii. 550, iv. 3723), were treated by free incision and washing out of the general peritoneal cavity, but without removal of the appendix; all died. Two cases (Male iv. 2277, v. 3044), were treated by free incision into the general peritoneal cavity and drainage, without washing out or removal of the appendix; both died. Twelve cases (Male i. 963, ii. 506,

1835, 2019, iii. 557, 1844, 2412, 2956, iv. 1901, 3699* ; Female ii. 1010 iv. 1620), were treated by limited incision through adhesions into the abscess cavity ; three of these died, one of cellulitis of the back and septicæmia, and in the other two cases it was found that the opening had accidentally been made into the general unobliterated peritoneal cavity as well as into the abscess cavity.

In one case (Male ii. 3123), a small incision was made into the abscess through adhesions only, and the appendix removed ; this patient recovered.

The details of these twenty-four cases, many of which were extremely ill at the time of operation, will be found in the second Appendix (p. 201).

There were eight cases of CHRONIC appendicitis with abscess. (Male i. 720, iii. 3392, v. 1536, 1758 ; Female ii. 1843, ii. 1864.) All were opened through adhesions, appendix not removed or looked for ; all recovered. (See Appendix II.)

There was one case (Male ii. 823), of appendicitis with internal strangulation of the intestine ; this patient was operated upon, but died. (See Appendix II.)

Of two cases of old appendicitis with sinuses, one was a case of a man, aged 36, in whom a sinus had persisted after an operation performed a year previously. (iv. 78.)

The other was a case in which the sinus had been present for years, and was due to a piece of bone. (See Appendix II.)

PERITONITIS.—A labourer, aged 60, was admitted in a dying condition with peritonitis, having been knocked down by a bicycle five days previously. He died on the day after admission. At the post-mortem, no definite signs of injury to the abdomen could be found. There was considerable chronic interstitial nephritis, which appeared to have been the main cause of death.

FISTULA IN ANO.—The only death was that of a man, aged 40, who died of phthisis a fortnight after admission, for a fistula of five months' duration ; no operation was performed. (i. 2527.)

TUBERCULOUS ULCER OF RECTUM.—A messenger, aged 21, had had for eight weeks pain on defecation and diarrhoea with blood. Two and-a-half inches up the rectum was an ulcer all round the rectum and extending beyond reach of the finger. He was treated locally with astringent injections and improved considerably ; he gained flesh while in the hospital. (ii. 3438*.)

DISEASES OF THE GENITO-URINARY ORGANS.

Bladder.

CALCULUS.—Two cases were not submitted to operation ; one was a man, aged 55, who was re-admitted with cystitis after lithotripsy, a small fragment of stone was washed out of his bladder, and he left the hospital cured. (ii. 1989.)

The other case was that of a female child, aged 3, admitted with retention of urine, in great pain, much emaciated and very ill. She had had symptoms of stone in the bladder for two years. The stone was pushed back into the bladder and the retention relieved, but the patient died, collapsed next day. At the post-mortem, the bladder contained a rough uric acid stone an inch in diameter. Both kidneys were dilated and contained pus. (v. 1205.)

CYSTITIS.—A stoker, aged 23, was admitted for cystitis and pyuria. Fifteen months previously an operation for radical cure of hernia had been performed at another hospital, and a pouch of bladder had been cut into. Subsequently, another operation for hernia was performed on the opposite side ; both wounds had healed, but the pyuria persisted ; the cystitis was relieved by the time the patient left the hospital twenty days after admission. (v. 1981.)

Kidney.

RENAL FISTULA.—These were cases in which the fistulous opening had followed a nephrectomy performed a few months ago, and a nephrotomy for pyonephrosis performed ten years ago. Each remained in hospital only a few days, no operation being performed. (Female iii. 51, and Male v. 1998.)

A woman, aged 60, who had had one kidney removed for malignant disease in the hospital, a little more than four years previously, was readmitted on account of a lumbar hernia; she was in good health. The symptoms of malignant disease had been present for five years previous to the operation. (ii. 1784.) (Statistics, under Lumbar hernia.)

Prostate.

ENLARGEMENT.—A silk dyer, aged 64, admitted with enlarged prostate and stricture, was very ill with pneumonia, of which he died on the third day after admission. At the post-mortem, both kidneys were found much disorganised and containing calculi. (i. 66.)

One patient was treated by supra-pubic cystotomy and prostatectomy and recovered. (v. 2290.)

The other ten cases underwent no operation and recovered.

Urethra.

STRICTURE.—Of sixty-one patients admitted for stricture of the urethra, fourteen underwent internal and ten external urethrotomy; two underwent supra-pubic puncture, and the remainder underwent no operation. Of the whole number, only two died; one was a railway servant, aged 47, who was admitted with retention and cystitis due to stricture; he was treated by catheters and washing out of the bladder, but he gradually developed symptoms of uræmia and died twenty-four days after admission. The post-mortem showed suppurative pyelonephritis. (i. 1002.) The other case was that of a printer, aged 44, who was admitted with a perineal abscess and a stricture of seventeen years' duration; he was treated by catheters and free incision of the abscess. The patient had repeated rigors, and gradually sank, dying on the twenty-third day after admission. At the post-mortem, it was found that there had been extensive burrowing of pus between the bladder and the rectum. The kidneys were in a condition of pyelonephritis. (i. 19.)

(See also other cases under the next heading.)

Urine and Urination.

EXTRAVASATION.—Three cases were admitted for extravasation of urine, in two cases due to stricture, in the third the cause was uncertain (iii. 1262). (See external urethrotomy.) One patient died; he was a porter, aged 50, who had had symptoms of stricture for two or three years. Incisions were made at once into the area of extravasation, which already extended high up on the abdominal wall. Very extensive sloughing, however, occurred, and the patient died on the eighth day. At the post-mortem, the subcutaneous tissue was found in a state of slough all the way from the perineum to the axilla. The kidneys were healthy. (iii. 2940.)

HÆMATURIA.—A man, aged 72, was admitted for hæmaturia of one month's duration and cystitis; the prostate was slightly enlarged; no definite diagnosis was made, but malignant disease of the bladder seemed probable. The patient gradually developed bronchitis, and died on the twenty-eighth day. There was no post-mortem. (v. 924.)

Vulva and Vagina.

NOMA.—A female child, aged 3 months, was admitted in a collapsed condition with noma vulvæ of seven days' duration. The patient died next day, and the post-mortem showed sub-pleural ecchymoses and other signs of acute septic poisoning. (i. 2497.)

DISEASES OF THE ORGANS OF LOCOMOTION.

Bone.

CARIES.—Of fifty-one patients admitted for caries of the spine, one died. This was a girl, aged 10, who died of tuberculous meningitis on the fifth day after admission for suppurative caries of the spine, which had existed four years. (v. 1642).

NECROSIS.—Two patients with necrosis of the femur died after sequestromy. (See Appendix II.) The only other death was that of a boy, aged 2, who was admitted with acute necrosis of five days' duration; he was very ill, and symptoms of septicæmia were already present; an incision was immediately made down to the bone and pus let out, but the child gradually sank and died fourteen days later; there was no post-mortem. (ii. 1823.)

EPIPHYSITIS.—A male infant, aged 9 months, who had been ill for ten weeks and whose shoulder had been swollen for four weeks, was admitted very ill with pyæmic symptoms; several abscesses were opened, but the child gradually sank and died on the thirty-sixth day after admission. The post-mortem showed epiphysitis of one shoulder, with suppuration in that joint and in both hips. (iii. 847.)

HYPERTROPHIC PULMONARY OSTEOARTHROPATHY.—The only case was that of a girl, aged 11; since the age of 5 she had been delicate; three years before admission adenoids had been removed at another hospital; soon afterwards, curvature of the spine had been first noticed; for this she had been treated at another hospital by spinal jackets, six months ago swelling of the feet and legs began; six weeks ago the hands first became affected. On admission, there was some pulmonary phthisis and dorsal scoliosis; the femora and humeri were apparently normal; the other bones of the limbs were the seat of much chronic thickening. Skiagraphs showed that this was very marked in the phalanges of the fingers. The patient was unable to walk without help. The treatment adopted was a spinal support. (v. 2443.)

Joints.

CHARCOT'S DISEASE.—The most interesting case was that of a girl, aged only 16; she had this disease in the hip in a well-marked form; it had existed for three years. (ii. 1555.)

TUBERCULOUS DISEASE.—A girl, aged 16, who had had the ELBOW excised two months previously, was re-admitted with an abscess, which was opened; a month later the wound had nearly healed, and she became an out-patient; when last seen, a month later, she could just hold her arm out at length without other support; there was no power of pronation or supination; the wound was still not quite healed. (ii. 2164.)

Of sixty-one patients admitted for tuberculous disease of the HIP, five died; three of these died after operations (one amputation following excision, two after excision, and one after amputation following excision); the other two were the following:—

A female infant, aged 20 months, admitted with hip disease of three weeks' duration, developed symptoms of diphtheria shortly after admission; tracheotomy was performed, but the child died immediately afterwards. The post-mortem showed much membrane in the larynx. The hip showed tuberculous disease of the synovial membrane; the cartilages and bones were sound, but there was a soft cheesy mass of tuberculous pus outside the capsule of the joint; there was no pus within the joint. (iv. 1239.)

A pale and emaciated boy, aged 10, who had previously had tuberculous disease of the foot and knee, was admitted with acute suppurative tuberculous disease of the hip. The abscess was opened and much caries of the femur and acetabulum was found, but no necrosis. Suppuration continued; the boy grew steadily worse, and eventually died four months after admission from secondary hæmorrhage from the gluteal artery. At the post-mortem, tubercle was also found in the lungs and kidney. The disease of the foot and knee had been cured. (iv. 817.)

A man, aged 28, who had undergone amputation at the hip for tuberculous disease sixteen years before, in this hospital, was readmitted with an ischio-rectal abscess. (ii. 3103.)

Of forty-five patients admitted for tuberculous disease of the knee, six were treated by amputation, all recovered; one by excision followed by amputation, this patient died; three by excision, one by arthrectomy, and the remaining thirty-four without operation; all these recovered.

ACUTE SUPPURATIVE ARTHRITIS.—One patient died. She was a woman, aged 37. An abortion six weeks before admission had been followed by rigors and fever; when admitted she was thin and ill and had acute arthritis of one hip; a month later an iliac abscess was opened; shortly afterwards fœcal matter came through the wound, then suppuration occurred in the gluteal region and elsewhere, and the patient finally died five months after admission. There was no post-mortem. (iv. 289.)

OLD EXCISIONS.—There were eight patients who had undergone excision of some joint before admission (wrist two, elbow two, hip one, knee three); seven of these are included in the statistics under other headings (for references see manuscript index in the library); the eighth case was that of a woman, aged 18, who had undergone resection of the knee three years previously for tuberculous disease; she was readmitted on account of the pain caused by the buried wires. The latter were removed. The knee was in good position and there were no signs of any active disease. (v. 1861.)

DISEASES OF THE CELLULAR TISSUE.

Abscess.

ABDOMINAL WALL.—The only fatal case was that of a man, aged 38, in whom the inflammation spread to the peritoneum and caused intestinal obstruction, described fully under abdominal section. (v. 714.)

A case of much interest was that of a woman, aged 37, who was admitted with a rounded elastic tender lump in the right hypochondriac region; it had been present six weeks. Some doubt was expressed as to its nature, the diagnosis lying between gall bladder and chronic abscess of the abdominal wall. It proved to be the latter, although very deeply seated. It was opened and drained, but the wound did not heal satisfactorily and had to be laid open again; the patient left the hospital on the fifty-ninth day after the first operation with a sinus still present. The exact nature of the abscess was never clearly ascertained. (ii. 1305.)

AXILLA.—A woman, aged 43, was admitted with a large axillary abscess, and a high temperature. The abscess was opened and drained, but another one formed over the sacrum a few days later, the patient then became delirious (and almost cataleptic at one time), developed cystitis, and finally died on the eighteenth day after admission. The post-mortem showed that there had been extensive suppuration about the cellular tissue of the neck and axilla, and that some of the cavities had not drained satisfactorily. The cause of the abscess could not be ascertained. (ii. 2661.)

NECK.—A mantle maker, aged 60, was admitted with an abscess of the neck, of three weeks' duration. This was opened, and the patient was rapidly convalescent; on the fifth day, while up and walking about, she suddenly became faint, and died within a quarter of an hour. At the post-mortem, the abscess cavity was found to be almost completely healed, and there was no fresh abscess anywhere else. The patient had a flabby and somewhat dilated heart and slight interstitial nephritis. No pulmonary embolism could be found. (iii. 2503.)

A labourer, aged 30, was admitted with an acute abscess of the neck, which was opened. Severe hæmoptysis occurred a few days later, and proved fatal; there was no post-mortem. (ii. 699.)

A pawnbroker's assistant, aged 21, was admitted with a large swelling of the thigh. It had been first noticed six months before admission, and had been gradually increasing in size ever since. He had never had any pain in it until about a month ago, when the skin over it became a little red. On admission, patient looked thin and delicate; at the upper and inner part of the right thigh, close to the pelvis, was a prominent globular mass, about four inches in diameter, tolerably moveable upon the deep parts, and quite hard. It was quite devoid of pain and tenderness, and although there was slight redness at one spot, there was no œdema of the skin. Temperature was never above 98·6°. Considerable doubt was expressed as to the nature of the tumour, which very closely resembled a sarcoma, but shortly after admission the skin over the tumour gave way, and a large quantity of pus escaped. The patient then made a rapid recovery. (iv. 3118.)

DISEASES OF THE CUTANEOUS SYSTEM.

Varicella gangrenosa.

A male infant, aged 9 months, admitted very ill with this disease, died with pyæmic symptoms a fortnight later. (iv. 2327.)

Xeroderma pigmentosum (Kaposi's disease).

The only case was that of a girl, aged 8. The disease had been first noticed at the age of two years. The face, neck, forearms and legs were covered with innumerable small brown and yellow blotches, resembling freckles, on both cheeks were some small white depressed scars. In some places there were scabs covering superficial ulcers. The skin of the affected parts was coarse and thick, and there were a few nævoid patches on the face and neck. The patient was transferred to a medical ward for treatment. (ii. 2200*.)

Phagædenic ulceration.

The compositor, aged 32, with phagædenic ulceration of the shoulder (described in last year's report, p. 113), was in the hospital again three times this year, and was eventually completely cured. (i. 3222*, 1349 and 2275.)

BURNS AND SCALDS.

Fifty-three patients were admitted for BURNS; of these, twenty died.

In the case of twenty-one female and six male patients (almost all young children), the burn was produced by the clothes catching fire; of these, four boys and nine girls died; nine of these died within twenty-four hours, the other four living two, two, four, and twenty-five days respectively.

In the case of three adult males, the burns were caused by chemicals, and were not severe; all recovered.

In the case of five adult women and one male infant, the cause was the upsetting of a lamp; of these, four women died (three within twenty-four hours, one on the thirty-second day).

Three adult women and two men were epileptics who fell on to the fire; all recovered.

A man, aged 99 years and 11 months, was smoking in bed, set fire to the bedclothes, and died within twenty-four hours. (iii. 174.)

In the case of four male and six female patients, the causes were miscellaneous or not stated; none of these died.

The most remarkable case of all was that of a boy, aged 9, who picked up in the street a piece of white substance, and not knowing what it was, put it into

his pocket. It proved to be phosphorus, which, igniting spontaneously, set fire to his clothes. He was admitted to the hospital badly burnt about the thigh, abdomen and hands. He quickly developed signs of pyæmia, and died on the twenty-sixth day with suppuration in many joints, necrosis of the skull and other signs of pyæmia. (iv. 3005.)

Of thirteen male and eleven female patients admitted for SCALDS, three died; a male infant, aged 11 months, upset a saucepan, was scalded on the chest, and died in four days (v. 802); a boy, aged 3, scalded on the face, neck and arm, died on the eighth day (iv. 3188); a girl, aged 2, scalded on the abdomen and legs by falling into boiling water, died on the second day. (ii. 1933.)

INJURIES OF THE HEAD.

WOUNDS.—GUNSHOT.—There were only two cases, both of them recovered. In one case, a man, aged 40, fired a pistol against the centre of his forehead, the bullet was flattened, but the man was not seriously hurt. (iii. 1482.)

A barman, aged 25, fired three shots at himself with a revolver, one missed, the other two penetrated the soft palate and lodged in the base of the skull. With the exception of slight transient inequality of pupils, he had no bad symptoms of any kind; no attempt was made to extract the bullet, and the patient left the hospital on the twenty-ninth day, quite well. (iii. 717.)

Concussion of the Brain.

Of seventy-three patients admitted, one died; he was a man of 54, who fell on to a kerbstone, and was admitted unconscious with a cut head; he became very delirious, and died on the third day; the post-mortem showed advanced interstitial nephritis, but no fracture of the skull. (i. 2524.)

A carman, aged 59, fell about twenty feet, he was not rendered completely unconscious and did not vomit. When admitted he had considerable weakness of right arm and leg, and his speech (which he said had previously been perfect) was slow and stuttering; there were no other signs of injury to skull or brain. He made a good recovery, and when he left the hospital on the twenty-seventh day, the weakness of limbs had gone and the power of speech had been almost completely restored. (iii. 3161.)

A coachman, aged 39, was thrown from a brougham, and apparently concussed. He went to another hospital where a cut on the head was sewn up, and he was then able to drive himself home, arriving in a semi-conscious state. On the following day he came to the hospital, and was admitted. He did not remember anything about the accident. He was quite conscious, but could not talk coherently, he repeated the same words constantly. There was no evidence of fractured base, there was a small wound on the right side of the head. In a few days he was quite well, except for some weakness of the grasp of the right hand and some hesitation in his speech. When he left the hospital on the twenty-sixth day, his symptoms had completely disappeared. It was believed that he had bruised Broca's convolution. (iii. 3494.)

Fractures.

BASE OF SKULL.—Of twenty-three patients admitted, eleven died.

A woman, aged 55, knocked down by a cab, died a few hours after admission; the post-mortem showed much laceration of brain, there was also a fracture of the leg. (v. 2585.)

A woman, aged 50, who fell downstairs, never regained consciousness, and died in a few hours; post-mortem, much laceration of brain. (ii. 552.)

A labourer, aged 41, fell twelve feet from a scaffold, never regained consciousness, and died in a few hours. (v. 2312.)

A man, aged 44, who fell out of a window, died next day, and was found to have fractured the superior maxillæ and nasal bones as well as the base of the skull. (v. 1952.)

A soldier, aged 36, fell downstairs and died in six hours without regaining consciousness; no post-mortem. (v. 51.)

A boy, aged 14, sliding down banisters, fell twenty feet on to his head and died in five hours; he had extensive fracture of base and vault and much laceration of the brain. (iii. 2947.)

A man, aged 65, was found unconscious, supposed to have fallen down; he died in six hours, and was found to have an extensive fracture of base and vault as well as a fracture of the pelvis and radius. (ii. 3296.)

A man, aged 37, was thrown from a van on to his head and died in twelve hours. The post-mortem showed a double fissured fracture of the posterior fossa and extensive intradural hæmorrhage. (ii. 1601.)

A vanguard, aged 14, fell from a van and died in about an hour and-a-half. The post-mortem showed an extensive fracture of the base, chiefly in the posterior fossa. (i. 3241.)

A man, aged 63, who fell off a van and died next day without regaining consciousness, was found to have a very extensive fracture of the base, with much effusion of blood and laceration of brain. (i. 1561.)

The eleventh fatal case was trephined. (Male iv. 3536.)

Among the twelve that recovered were the following:—

A traveller, aged 81, knocked down by a mail cart, was admitted bleeding from the ear; for eight days there was much restlessness and delirium; he then began to improve, but left the hospital on the sixteenth day against advice. (v. 618.)

A labourer, aged 39, fell downstairs; blood and cerebro-spinal fluid ran from the ear and he was unconscious for many hours; two days later he became wildly delirious and remained so for a week; he then recovered, and discharged himself on the twenty-first day, convalescent. (iv. 1697.)

A labourer, aged 44, fell in the street, remained more or less unconscious for a fortnight, then began to improve, and finally left the hospital on the thirty-sixth day, quite well. (iii. 1069.)

A labourer, aged 28, struck by a falling plank, fractured the supra-orbital ridge and orbital plate of the base of the skull and made a rapid recovery. (iii. 1451.)

A woman, aged 56, after a severe injury to the head, remained unconscious for nearly three weeks and then recovered. (iii. 2522*.)

VAULT.—Of five patients with simple fractures, three died.

A butcher, aged 27, fell through a roof, striking his forehead; no fracture of the skull could be detected. On the tenth day he developed signs of meningitis, of which he died on the twenty-eighth day after admission. The post-mortem showed an extensive comminuted slightly depressed fracture of the frontal bone, extending backwards through the ethmoid and sphenoidal cells; there was basal septic meningitis. (ii. 332.)

A man, aged 50, was struck on the head by a heavy piece of falling timber and was admitted semi-conscious; an exploratory incision over the parietal showed only a linear fracture of the vault. The patient soon became noisy and restless, then comatose, and died on the sixth day. Post-mortem showed that the fracture ran downwards into the great wing of the sphenoid. There was a little extra dural hæmorrhage and slight laceration of brain; there was no definite evidence of meningitis. (ii. 586.)

The third fatal case was trephined. (Male v. 3767.)

Two infants, a male, aged 4 months, and a female, aged 20 months, with simple depressed fractures of the vault, made rapid recoveries. (v. 3024 and iv. 1256.)

COMPOUND FRACTURE OF SKULL WITHOUT DEPRESSION.—Of ten patients, one was trephined and eventually died. (Female iv. 24.)

The other nine all made rapid recoveries.

COMPOUND FRACTURE WITH DEPRESSION.—Of six patients admitted, five underwent trephining or elevation of bone; two of these died. The sixth case was that of a girl, aged 4, who fell out of a window, and was admitted with depression of the frontal bone over a large area and a scalp wound and fissured fracture in connection with it. No operation upon the bone was performed, and the child made an excellent and complete recovery; the depression of the bone remained very marked. (iii. 1487.)

PUNCTURED FRACTURE OF BASE.—A male infant, aged 11 months fell, off a chair with a lead pencil in its mouth. The pencil, which was firmly jammed into the roof of the mouth, was extracted with some difficulty and the child then brought to the hospital. It rapidly developed meningitis and died on the third day. At the post-mortem, the pencil was found to have perforated the ethmoid and passed deeply into the brain. (v. 3228.)

INJURIES OF THE ABDOMEN.

Contusions.

A man, aged 19, who fell sixty feet down a lift shaft, was admitted with a bruise of the abdomen, but made a rapid recovery. (iv. 2334A.)

Wounds.

LACERATED.—A girl, aged 3, was run over by a tramcar, and was admitted, collapsed, with extensive lacerated wounds of the abdomen and buttock; a rent in the abdominal wall was large enough to admit two fingers into the peritoneal cavity. She died in a few hours. At the post-mortem, it was found that the sacro iliac joint was gaping widely, and that the right external iliac artery had been contused and occluded. (iii. 1189.)

Rupture of duodenum.

A boy, aged 17, was run over by a waggon; when admitted he was not greatly collapsed, but the abdomen soon became distended, and he died of peritonitis within twenty-four hours. (ii. 1210.)

Rupture of liver.

A boy, aged 16, who had been run over, died a few hours after admission. At the post-mortem, it was found that eight ounces of liver had been torn completely away from the upper and back part of the liver. (v. 3380A.)

There were also two other cases of ruptured liver, which appear in the Statistics under rupture of spleen and fracture of pelvis respectively. (Male iv. 1915, Female i. 1597.)

Rupture of pancreas.

A man, aged 37, was squeezed between a van and the pole of another van, the latter striking him in the epigastrium; he came to the hospital at once, and complained of slight pain in this region; the abdomen moved well, nothing abnormal could be felt, the pulse was good, there were no signs of internal hæmorrhage or collapse. He was not thought to be seriously injured, but was

kept one night in the surgery ward, and thence admitted. On the evening of the day after admission, he suddenly became collapsed, but the abdomen still showed no definite signs of injury; orthopnoea was now the most prominent feature of the case. He recovered from the collapse, and for the next twenty-four hours seemed better; vomiting then set in and continued until he died, forty-five hours after admission and three days after the accident. The post-mortem showed much bruising of the pancreas with hæmorrhage into the lesser sac of peritoneum. There was extensive fat necrosis and some bruising of the lungs. (v. 3026.)

Rupture of spleen.

There were three cases; all died.

A man, aged 42, run over by an omnibus, was admitted with several broken ribs and much surgical emphysema; he recovered somewhat on the following day, then the abdomen became distended, vomiting set in, and he died on the second day after the accident. The post-mortem showed much blood in the left pleura and a little in the right. On the left side the second to the twelfth ribs were all broken, and there was a pint of blood in the peritoneal cavity. The spleen was much lacerated and its vessels torn completely across. (ii. 3792.)

A labourer, aged 40, fell from a scaffold, and died in nine hours. The post-mortem showed a pint of blood in the peritoneal cavity, the spleen much smashed, the liver slightly torn, and numerous ribs broken on the left side, with much blood in the left pleura. (iv. 1915.)

A bicyclist, aged 26, was run over by an omnibus, his machine having skidded; he was admitted much collapsed, and died in eight hours. The post-mortem showed rupture of spleen, rupture of left kidney, rupture of right renal vein, fracture of several ribs and of some of the transverse processes of the lumbar spine. (v. 1347.)

For another case, see rupture of stomach.

Rupture of kidney.

Of three cases, the one that died is described under exploratory laparotomy (iii. 1664). A man, aged 19, was struck on the left loin by machinery; he was admitted with much hæmaturia, vomiting, thirst and abdominal distension. Evidence of a large effusion of blood soon appeared on the left side of the abdomen, this gradually subsided, and the patient left the hospital on the thirty-eighth day quite well. The hæmaturia had lasted thirty days and then ceased completely. (ii. 2914.)

Other cases are recorded under rupture of spleen and rupture of stomach.

Rupture of stomach.

Both cases died. A wheel of a van passed over the abdomen of a boy, aged 5; he was admitted soon afterwards, much collapsed and very restless; there were no external signs of injury, except the abdominal distension; he vomited some food and a little blood. The boy's condition seemed too bad to justify any operative interference, and he died seven hours after the accident. At the post-mortem, free gas and much food were found in the peritoneal cavity. In the anterior wall of the stomach, near the pylorus, was a rent two inches long; there was also rupture of liver and spleen, and both lungs were contused. (ii. 2043.)

A wheel passed over the abdomen of a boy, aged 9; when admitted to the hospital immediately afterwards he was profoundly collapsed; he vomited twice—no blood in the vomit; he passed a little bloodstained urine. He died three and-a-half hours after the accident. The post-mortem showed a half-digested meal in the peritoneal cavity. There was a rent two and-a-half inches long in the anterior wall of the stomach, near the greater curvature, the left kidney was much lacerated, the right slightly. (iv. 2445.)

INJURIES OF THE THORAX.**Gunshot wound.**

A printer, aged 26, was shot with a revolver, the bullet entering near the ninth rib in the left posterior axillary line and passing downwards and inwards; there was much hæmaturia, which lasted three weeks. No attempt was made to extract the bullet (except by the house-surgeon who probed the wound in the surgery), and the patient made an excellent recovery and left the hospital on the sixty-eighth day quite well. (iii. 362.)

A patient, who had had a bullet in his chest for fourteen years, was in the hospital for a few days; it gave him little or no trouble, and was not interfered with. (iv. 3235.)

Laceration of lung.

A boy, aged 10, who had been run over, was admitted much collapsed and with right pneumothorax; the heart was much displaced. He made an excellent recovery, and left the hospital on the twenty-fourth day. (i. 280.)

Fracture of ribs.

A man, aged 50, fell from a scaffold, and was admitted with fracture of many ribs on both sides. He quickly developed pneumothorax, and died of dyspnoea and bronchitis on the ninth day. At the post-mortem, the right pleura was found full of air, the lung having been lacerated by the broken ribs. (iv. 3211A.)

A man, aged 46, fell from a scaffold, and died on the tenth day; the post-mortem showed numerous fractures of ribs, collapse of right lung, fracture of clavicle, olecranon, &c. (ii. 1040.)

A cabman, aged 28, thrown from his cab, sustained severe injuries to ribs and lungs, and died in an hour and-a-half; no post-mortem.

INJURIES OF THE NECK.**Incised wounds (cut throat).**

Of six cases, five were suicidal, and all recovered. The sixth was the result of accident, and was very remarkable: a boy, aged 8, was carrying a jug, when he slipped and fell on to it, a broken fragment inflicting a deep wound in the neck. On admission, it was found that the pharynx had been freely opened by a clean cut transverse wound immediately above the thyroid cartilage. The epiglottis had been completely divided. At the back of the pharynx was a wound extending to the vertebræ. The boy died of septicæmia on the third day, his temperature having risen to 106°. At the post-mortem, a small piece of china was found in the wound at the back of the pharynx. (iii. 377.)

Strangulation.

A carman, with commencing delirium tremens, attempted to commit suicide by hanging. He was found suspended by a handkerchief and quite insensible. He was at once partially restored by artificial respiration, and brought to the hospital two hours later, still insensible and breathing stertorously. He was eventually brought round, and then showed symptoms of delirium tremens. He was very violent for a few days, then made a good recovery, and left the hospital on the tenth day, quite well. (iv. 1696.)

INJURIES OF THE BACK.**Concussion of spine.**

A labourer, aged 52, fell eleven feet on to some mud, striking the back of his neck; he did not lose consciousness, but became partially paralysed in both arms and legs. He had much pain in the arms. The knee jerks were

not lost. The patient made a slow but steady recovery, complicated by cystitis and rigors in the course of the second month. On the ninety-third day he was discharged, practically well, able to walk, but dragging one foot slightly. (ii. 3783*.)

Fracture of cervical spine.

A woman, aged 39, fell thirty feet out of a window, and died in a few hours. The post-mortem showed a fracture through the sixth vertebra and complete crush of the cord; the posterior fossa of the skull was also fractured. (i. 1122.)

A boy, aged 8, across whose neck the wheel of a van had passed, also died in a few hours. The sixth vertebra had been broken and the cord crushed. (i. 1575.)

INJURIES OF THE PELVIS.

A schoolgirl, aged 7, fell about seventy feet into a yard, and was admitted much collapsed; the abdomen was much distended and contained free fluid. There was an extensive fracture of the pelvis and much tenderness over the liver, which was believed to be ruptured. The patient made a slow but steady recovery, and was removed from the hospital on the thirty-first day against advice. (i. 1597.)

A pewter-pot maker, aged 63, was admitted for gouty arthritis of the knee and cystitis. Six weeks previously he had fallen on his hip. On admission, there was considerable stiffness and deformity about the hip. A fortnight later the patient died of his cystitis, and at the post-mortem, a starred fracture of the pelvis was found, the head of the femur having been partially driven through into the pelvis. (iii. 170.)

INJURIES OF THE UPPER EXTREMITY.

Fractures.

OLD UNUNITED OF ULNA.—The miner, aged 53, who had on previous occasions been in the hospital for ununited fracture of radius and ulna, and had had transplanted into him portions of human fibula and dog's femur (see last year's report, page 151) was re-admitted for a few days. He was found to have union of the radius, and fair union between the lower end of the ulna and the dog's bone, but none above. No further operation was performed. (iii. 1061.)

INJURIES OF THE LOWER EXTREMITY.

Contusions.

A cabman, aged 52, who had been thrown from his cab, was admitted with a severe contusion of the hip. He was found to have phthisis also, and of this he died three weeks after admission. At the post-mortem, much old and recent tubercle was found in the lungs. (ii. 2927.)

Fractures, Simple.

FEMUR.—A woman, aged 73, was admitted with an intracapsular fracture of the femur. On the eleventh day she was suddenly seized with dyspnoea, and died in a few minutes. At the post-mortem, a large embolus was found blocking each of the two pulmonary arteries. The source of the embolus could not be ascertained definitely; it was probably the heart. (i. 1451.)

A woman, aged 62, who had broken the neck of her femur five months previously, was re-admitted with pneumonia, and died of it twelve days later; no post-mortem. (i. 194.)

A man, aged 67, admitted with locomotor ataxy and a simple fracture of the shaft of the femur, gradually sank and died eleven days later. Nine years previously he had broken the opposite femur with little violence. The post-mortem showed general unsoundness of viscera and vessels. (ii. 877.)

PATELLA.—Seventeen male and twelve female patients were admitted for recent fracture of the patella (one patient was admitted twice).

Two male patients were treated by wiring operations; the average stay of these patients in the hospital was 37 days (36 and 39). (Male v. 1284 and 3045.)

A hatter, aged 22, was admitted with a recent fracture of the patella. Nine weeks previously he had broken the same patella, and had been treated at another hospital by primary wiring. He had been kept in bed four weeks, and had then got about with the knee in plaster. The plaster had been removed only a few days before the present accident occurred. The new fracture was apparently in exactly the same place as the old, and when the swelling subsided, a loop of wire apparently unbroken could be distinctly felt; apparently the wire had cut through the bone. At the patient's own wish he was sent back to the hospital where he had first been treated. (iii. 2977.)

In three cases, the fracture was complicated with other fractures (femur, ii. 2374 and v. 1357; leg, iv. 850). The average stay of these patients was sixty-six days.

The remaining twenty-three cases (excluding the re-admission case who was only in for one night) were treated by rest in bed and some form of mechanical appliance; the average stay in the hospital was twenty-nine days. One of these cases was a man, aged 70, who had been in the hospital fifty years ago for suppuration in the knee joint, the result of a wound; the knee had been stiff ever since. On the day of admission he fell down some steps on to the knee, broke down the old adhesions, and fractured the patella of the same side at the same time. He made a good recovery. (i. 638.)

TIBIA AND FIBULA.—A man, aged 48, admitted with a simple comminuted fracture of both bones, was immediately attacked with delirium tremens, and died in two days; there was no post-mortem. (iii. 934.)

Compound.

FEMUR.—A labourer, aged 62, who had been run over, died two days after admission; the post-mortem showed interstitial nephritis and cirrhosis of the liver. (iv. 203.)

A clerk, aged 77, slipped and fell, breaking his femur in the upper third; there was a small wound of the skin. He did well for a fortnight, then gradually sank, and died on the twentieth day. The post-mortem showed also interstitial nephritis and an old cerebral hæmorrhage. (iii. 1068.)

TIBIA AND FIBULA.—Twenty-eight patients were admitted for compound fracture of the tibia and fibula; of these, three were treated by primary amputation and recovered; twenty-four recovered without operation, and only one died; this was a railway servant, aged 56, who was run over by a railway truck, and died in a few hours. At the post-mortem, this patient was found to have also a small villous papilloma of the bladder, which had caused no symptoms. (i. 1371.)

Old Fractures.

PATELLA.—Seven patients were in the hospital with old fractures of the patella. Of these, four were admitted for something else. (Female, contusion of thigh, iii. 724, Male, ankylosis of jaw, i. 447, wound of hand, iii 752, and contusion of leg, iii. 753.)

Of the remaining three who were admitted on account of the condition of the patella, one man had had primary wiring done thirteen months previously, and was admitted to have the wire removed (ii. 1162); another man who had had a primary wiring operation at another hospital fifteen months before, was admitted with a knee ankylosed by suppuration, and with so much deformity that he could not walk; (described under excision of knee, v. 2737). The third patient was a woman who had broken her patella ten months before, and was admitted for a secondary wiring operation (see Appendix II., iv. 354). The last two patients were in the hospital twice.

TABLE II.
SURGICAL OPERATIONS PERFORMED.

OPERATIONS.		AGE AND SEX.																							
		TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.		-50.		-60.		-70.		Over 70.	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
OPERATIONS ON THE EYE.																									
Abscission	2	...	2	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Canaliculus Slit	4	16	4	16	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cataract Extraction	25	32	25	32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cauterisation of Ulcer	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Corneal Section	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Extirpation of Globe	15	13	15	12	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Extraction of Dislocated Lens	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iridectomy	9	19	9	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Needling	13	19	13	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Paracentesis of Anterior Chamber	2	1	2	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Removal of Dermoid	1	2	1	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Squint—	5	4	5	4	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tenotomy	5	2	5	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Advancement of Rectus	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
PLASTIC OPERATIONS.																									
For Buccal Fistula	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Cleft Palate	14	3	14	3	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE II. (continued).

OPERATIONS.		AGE AND SEX.																							
		TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.		-50.		-60.		-70.		Over 70.	
		M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
OPERATIONS ON LARYNX AND TRACHEA (continued).																									
Excision of Larynx (partial, for Sarcoma) ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thyrotomy— <i>For Paralysis of Vocal Cords</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
OPERATIONS ON NERVES.																									
Suture of Nerves—																									
Primary—																									
<i>Median</i> ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Median and Ulna</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Ulnar</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Secondary—																									
<i>Digital</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Median</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Radial</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Ulnar</i> ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Resection and Transplantation																									
<i>Median</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Excision of Nerves—																									
<i>In Scar</i> ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ulnar Nerve freed from Scar	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Division of Gustatory Nerve...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Exploratory ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

AGE AND SEX.

OPERATIONS.	TOTAL.		Under 5 Years.		-10.		-20.		--30.		-40.		-50.		-60.		-70.		Over 70.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
OPERATIONS ON GENITO-URINARY ORGANS (continued).																					
Lithotomy—																					
(Perineal) ...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Supra-pubic) ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cystotomy—																					
(Supra-pubic) ...	8	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Perineal) ...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Supra-pubic Puncture	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Castration—																					
For Epithelioma of Scrotum	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Gangrene	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Hematocele	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Retained Testis	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
" Tubercle	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erasion of Tubercular Testis	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Transplantation of Retained Testis	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ligature of Varicocele—																					
(Open Method)	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Subcutaneous)	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Acupuncture of Hydrocele	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Injection of Hydrocele	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Excision of Sac of Hydrocele	17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Excision of Sac of Hæmatocele	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Internal Urethrotomy	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

AGE AND SEX.

OPERATIONS.	TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.		-50.		-60.		-70.		Over 70.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.		
ABDOMINAL SECTION (continued).																										
*For Appendicitis— (Acute Appendicitis, with suppuration)—																										
a. A free Incision into general peritoneal cavity, removal of Appendix, washing out and drainage	4	3	2	1	2	2	...	...	1	...	2	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...
b. Free Incision and washing out, but no search for Appendix ...	3	...	...	...	3	...	...	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
c. Free Incision and drainage, no washing out, no search for Appendix ...	2	...	...	...	2	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
d. Limited Incision through peritoneal adhesions, no removal of Appendix ...	11	2	8	2	3	...	...	...	2	...	2	2	6	...	...	...	...	1	...	...	...	...	...	...	...	...
e. Limited Incision through peritoneal adhesions, with removal of Appendix ... (Chronic Appendicitis, with suppuration)—	2	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
a. Limited Incision through adhesions, no search for Appendix ...	4	2	4	2	...	...	...	...	...	...	2	...	1	...	1	2	...	...	...	...	...	...	...	...	...	...

* All Operations upon the Appendix, whether large or small, have for convenience been included here; many of them could not strictly be called Abdominal Section.

TABLE II. (continued).

OPERATIONS.	AGE AND SEX.																								
	TOTAL.		Discharged.		Died.		Under 5 Years.		-10.		-20.		-30.		-40.		-50.		-60.		-70.		Over 70.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	
ABDOMINAL SECTION (continued).																									
Appendicitis (continued)—																									
(Chronic recurrent Appendicitis, without abscess)—																									
Free incision, removal of Appendix	5	3	5	3	...	...	...	...	1	...	3	...	1	2	...	1	...	...	...	...	...	...	...	...	...
(Acute Appendicitis, with strangulation of intestine by adhesions)—																									
Free incision and removal of Appendix	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Old Appendicitis with sinuses)—																									
Removal of Appendix and Foreign Body	1	...	...	...	1	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Enterotomy	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Enterotomy*—																									
Abdominal Section and Plastic Operation for Intestinal Fistula	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Removal of Retro-peritoneal Cyst of doubtful nature	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
For Extra-Uterine Gestation	...	4	...	3	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Removal of Uterine Appendages...	...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Removal of Uterine Fibroid...	...	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hysterectomy (Abdominal)— For Fibroid	...	5	...	3	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...

* The only cases underwent also Pylorectomy and Herniotomy (q.v.).

STATISTICS OF ANÆSTHETICS.

During the year 1896 Anæsthetics were administered 5,410 times.

Chloroform	...	...	...	...	...	...	2,436 times.
Nitrous Oxide Gas	...	...	...	...	...	...	1,427
Gas and Ether	...	...	...	...	...	...	1,272 ,,
Ether	...	...	...	...	...	...	189 ,,
Mixture of Chloroform and Ether	...	...	...	...	...	...	48 ,,
Mixture of Nitrous Oxide and Oxygen	...	...	...	...	...	...	38 ,,
Total	...	...	...	...	...	...	5,410 ,,

There were three deaths.

1. Boy, aged 6. [Previous administrations of chloroform, four for empyema and abscesses in chest wall.] Respiration stopped five minutes after commencement of anæsthetic, which was chloroform. Post-mortem. Left lung collapsed; left pleura thickened and adherent everywhere; numerous abscesses in pleura and chest wall; actinomycosis of pleura.

2. Female, aged 26. Chloroform for removal of thyroid tumour. Induction of anæsthesia normal. Breathing stopped during enucleation of the tumour at an early stage of the operation. Effort to restore natural respiration by drawing tongue forward and artificial respiration unsuccessful. No post-mortem.

3. Male, aged 28. Rigidity of jaw muscles, associated with chronic inflammation of parts about and below left lower jaw. Three minutes from commencement of administration of chloroform, patient became rigidly convulsed. Inability to open mouth. Tracheotomy and artificial respiration. No post-mortem.

APPENDIX TO TABLE II.

Table II. includes not only all operations performed upon patients in the Surgical Wards, but also those performed upon patients in the Medical and Gynæcological Wards. The latter cases do not appear in Table I. In this Appendix, as in the previous one, all fatal cases and many of the more important of the other cases are described.

OPERATIONS ON THE EYE.

A girl, aged 16, with tubercle in the choroid and elsewhere, died of tuberculous meningitis after extirpation of the globe. (Ophthalmic Register, No. 507.)

PLASTIC OPERATIONS.

For congenital dislocation of hip.

A female child, aged 2, was admitted with unilateral dislocation of the hip. There was a considerable limp when the child walked. An operation was performed through an anterior incision, a new acetabulum being formed. The shortening (about $\frac{3}{4}$ -inch) could not, however, be remedied. On the second day after the operation the temperature rose to 103°, and a mild attack of scarlet fever ensued. This again was followed by suppurative otitis media, and the child eventually left the hospital, seventy-six days after the operation, with the hip moveable, and in much the same condition as before the operation. (iii. 1540.)

For contracted scars.

A girl, aged 3, who had already undergone several operations for deformity of the eyelids after an extensive burn of the face, was re-admitted, and underwent two further plastic operations with considerable benefit. (iii. 278, Violet H.)

For ectopia vesicæ.

One patient was a boy, aged one year and seven months, with a slight degree of this malformation. Just above the pubes was an opening large enough to allow a little finger to pass into the bladder. The urethra was open along its whole length. A plastic operation resulted in the orifice being made somewhat smaller. (i. 1522.)

The other case was that of a man, aged 23, who had ectopia vesicæ of the ordinary severe type. An operation had been performed upon him fourteen years before at another hospital without any benefit. Six plastic operations were performed upon him during his stay of eight months in the hospital. The dorsal surface of the penis was sewn to the edges of the vesical surface to

form an anterior wall to the reconstructed bladder. The testicles were both removed as a preliminary proceeding. The patient eventually left the hospital somewhat improved and able to keep himself dry for an hour and a half at a time. He was re-admitted a few weeks later. (iii. 2254*.)

For imperforate rectum or anus.

Of the four operations, one was upon a child, aged 2 months, in whom there was also a rectovaginal fistula. (i. 2330.)

Another female child, aged 6 days, had much distension of the abdomen; the rectum was brought down and fastened to the skin of the anal region. (iii. 1190.) Both these cases made good recoveries.

A male infant, aged 36 hours, had much distension of the abdomen, and was cyanosed and very ill. An incision down to the coccyx let out much meconium and gas. The distension was relieved, but the child's general condition did not improve, and the child died on the second day after admission. No post-mortem. (iii. 3620.)

A male infant, aged 3 days, was admitted with a greatly distended abdomen having passed nothing at all per anum. The anus itself was well formed and appeared to be normal, but an obstruction could be felt about $\frac{3}{4}$ -inch above it. A hypodermic needle inserted by the house surgeon withdrew meconium and gas; the distension was relieved for a time, but soon returned. On the second day after admission, an incision was made down to the coccyx; much gas came away, but no meconium. A catheter passed into the wound drew off a little meconium. The child died three days later, and at the post-mortem it was found that there was a fold of peritoneum completely separating the upper and lower portions of the rectum; the former had not been opened by the incision, but had been punctured by the syringe which had passed through the peritoneum, and thus set up an acute peritonitis. (iii. 1084.)

For Macrostoma.—The hawker whose case is described on page 113 of last year's report, under phagedœnic ulceration, was re-admitted, and underwent a plastic operation to close the cleft in the cheek. The wound, however, broke down, and no improvement followed. (i. 240.)

For Microstoma.—A girl, aged 2, with contraction of the mouth after a burn, was much improved by a plastic operation. (iii. 2429.)

Rhinoplasty was performed seven times.

Two of these operations were upon a woman, aged 26, with depression of the bridge from old syphilitic disease (see last year's report, page 144). Considerable improvement was effected. (v. 1389 and 2508.)

Another woman, aged 31, was much improved by an operation for stenosis of the nares. (ii. 1011.)

A man, aged 60, with a large fistulous opening into the upper part of the nostril, caused by the removal of a carcinoma from the interior of the nostril eight months previously, underwent rhinoplasty, a flap being turned down from the forehead. He was much improved, the opening being diminished to half its original size. (i. 1113, and last year's report, page 146.)

A brewer, aged 46, had had syphilis twenty years ago; three and a half years ago, a blow on the nose was followed by necrosis of the nasal cartilages and much falling in of the nose; he had also necrosis of the hard palate. A flap was turned down from the forehead, and a columna formed by turning a piece of the superior maxilla forwards. The patient did very well, and was greatly improved; the operation was not followed by any unusual degree of inflammation, in spite of recent syphilitic disease. (ii. 3673*.)

The same patient was re-admitted four months later, and underwent a small trimming operation. (ii. 1507.)

The seventh case was that of a man, aged 62, with a rodent ulcer of the nose; the growth was freely excised, and the wound covered in at once by turning in a flap from the cheek. The case did very well. (v. 2572.)

For stenosis of the pharynx.—The man whose case is recorded in last year's report (page 144) was re-admitted, contraction having again taken place. The remainder of the soft palate was cut away, and a free passage established between nose and the mouth. (iv. 593.)

EXCISIONS OF BONES AND JOINTS.

Astragalectomy.—In six cases for talipes.

One case was that of a girl, aged 9, in whom double astragalectomy and double tarsectomy were performed, but not simultaneously; the result was very good. (v. 1285 and 2638.)

The seventh case was that of a man, aged 18, admitted with a simple dislocation of the astragalus, and other injuries. The bone was removed on the eighteenth day, and the patient made a good recovery, leaving the hospital on the seventy-ninth day with the foot in good position. (iii. 2251.)

Excision of the elbow was performed three times; once for tuberculous disease without external suppuration upon a girl, aged 16 (ii. 1658); twice for ankylosis upon women, aged 19 and 20. (v. 1824 and 2345*.)

Excision of the hip was performed seven times, in all cases for tuberculous disease. Three patients died.

A man, aged 19, who had previously been in the hospital with suppurative disease of the hip, was re-admitted with a large abscess. The disease had existed four years. The abscess was opened and drained, but fresh abscesses formed, one of which burst into the rectum. Seven months after admission, excision was performed. The suppuration continued, and the patient died of emaciation and amyloid disease seven months after the operation. No post-mortem. (i. 1382*.)

A girl, aged 7, admitted pale and thin, with hip disease of two years' duration, the limb being in a bad position. Three weeks after admission the limb was examined under an anæsthetic, and the position improved. Four months later an abscess appeared, and was opened, scraped and drained. Two months later a sinus was still present. The temperature, hitherto normal, now began to be irregular. Seven months after admission anterior excision of the hip was performed, the joint was found to be much disorganised; further suppuration occurred about the gluteal region. In the next four months four more operations were done for the evacuation of pus. The patient improved during the next two months, and appeared to be doing well; the sinuses had nearly healed, when suddenly symptoms of acute peritonitis set in, and the child died next day. Post-mortem, the disease of the hip itself was at an end; there were a few sinuses nearly healed; there was much recent pus in the peritoneal cavity; the exact source of this could not be ascertained, but it seemed probable that a chronic intraperitoneal abscess had burst; there was no tubercle of the peritoneum. (iv. 1183.)

The third fatal case, that of a boy, aged 14, in whom the excision was followed two months later by amputation at the hip, is described under the latter heading. (v. 1749.)

Four cases recovered.

A schoolboy, aged 8, was admitted with hip disease of four months' duration ; three months later, an abscess having been detected, excision was performed ; the skin at this time was unbroken ; the patient made a good recovery, and the wound was healed when the patient left the hospital, forty-five days after the operation. (ii. 3031*.)

A thin, unhealthy boy, aged 2, admitted with double hip disease, on the right side was a sinus, on the left an unbroken abscess. Excision of the left hip was performed, and the child left the hospital two months afterwards much improved, the wounds on the right side being healed, those on the left side nearly so. (ii. 57.)

A boy, aged 13, who had had hip disease for four years, and had been under treatment in the hospital a few months before, was re-admitted with a chronic abscess. This was opened, and the joint scraped ; the wound healed, and then broke down ; the temperature remained normal for two months, then began to rise. Three weeks later, excision through an anterior incision was performed, much caries of the joint being found. The temperature soon began to improve, and was never afterwards much above normal. The wound, however, broke down, and on various occasions abscesses had to be opened and small pieces of dead bone extracted. The boy was eventually discharged eleven months after admission with sinuses still unhealed, although the general condition was improving. (ii. 3292*.)

A boy, aged 4, was admitted with hip disease of four months' duration, with no suppuration ; he was treated with splint and weight. Four months later, an abscess having formed, an incision was made over the front of trochanter, and six ounces of pus let out. Three months later, the sinus not having healed, excision was performed, the head of the bone being found carious, but not necrosed. Three months later, patient was discharged with sinuses almost healed. The temperature, both before and after operation, had rarely been above normal. Eleven months later (1897) he was re-admitted with a fresh abscess. (ii. 961*.)

Excision of the lower jaw (partial) was performed twice for recurrent epithelioma upon men, aged 65 and 47 ; the first case did well ; in the other, recurrence took place before the patient left the hospital. (ii. 47 and 356.)

Excision of the upper jaw, partial or complete, was performed seven times with uniformly good results ; it was done four times for EPITHELIOMA upon women, aged 51, 52 and 43 (i. 1707, iv. 2015 and 1103), and upon a man, aged 43 (iii. 111) ; once upon a woman, aged 38, for a SARCOMA of the anterior wall of the antrum of ten weeks' duration (iv. 2609*) ; once upon a girl, aged 14, for a MYELOID SARCOMA of four months' duration (i. 2259) ; and once for a FIBRO-ANGEIOMA of the naso-pharynx ; this patient was a man, aged 19. Five months previously, he had first noticed difficulty in breathing through the left nostril, and a lump appeared upon the cheek ; subsequently, frequent hæmorrhage occurred from that nostril. He was admitted with a considerable tumour bulging out the cheek, causing protrusion of the eyeball, blocking the nostril, pushing down the palate, and forming a soft swelling that could be felt behind the soft palate. The case looked exactly like one of very malignant sarcoma, except in one respect, namely, that the swelling in the naso-pharynx was singularly round and smooth. The upper jaw was removed, and the tumour found to be a fibro-angioma of the naso-pharynx as large as an orange. It had displaced and absorbed all the surrounding bones to a remarkable extent. The tumour was rapidly shelled out ; the hæmorrhage, very profuse for a few moments, soon ceased, and the patient made an excellent recovery, leaving the hospital thirty-three days after the operation. When re-admitted five months later for an obturator, he was in excellent health. (iv. 675 and Museum 1770M. and 1770D.)

Excision of the knee was performed four times for tuberculous disease, and once for ankylosis and deformity after a primary wiring operation, done at another hospital, for simple fracture of the patella. One patient died.

A woman, aged 36, who had had tuberculous disease of the knee on and off for eleven years, but who had no external suppuration, underwent excision, the bones being united by steel pins; she made a good recovery, leaving the hospital on the seventy-third day after the operation with the wounds soundly healed, and the limb in good position. (iv. 426.)

A similar case was that of a man, aged 22, with disease of four years' duration, and no external suppuration; the steel pins were removed on the thirteenth day, and the patient left on the ninety-first day, quite well. (iv. 1993.)

A boy, aged 17, with old disease and much flexion and ankylosis, also made a good recovery. (ii. 1917.)

A man, aged 30, underwent excision for bad tuberculous disease; the case did not do well, and amputation was eventually performed, and the patient died. (Described under amputation, page 169, iv. 3578*.)

A baker, aged 22, was admitted with ankylosis and much deformity. Fifteen months previously, he had sustained a simple transverse fracture of the patella. An open wiring operation, performed at another hospital three days after the accident, had been followed by suppurative arthritis and suppuration among the muscles of the thigh. The wires were removed four months later, and the patient gradually recovered, but with a leg upon which he could not walk. Excision of the knee was performed, and the bones wired together, with an excellent result, the patient leaving the hospital forty-one days later with the bones soundly united in good position. (v. 2737.)

Excision of metacarpals.—A clerk, aged 29, was admitted with a remarkable symmetrical congenital malformation of both hands. All the fingers were flexed at their metacarpal joints, and deflected to the ulnar side. An inch of each of the metacarpal bones of one hand was resected, the position of the fingers being much improved, although the increased utility of the hand was not obvious when he left the hospital fifty-two days after the operation. (ii. 1258.)

Excision of the head of the metatarsal was performed five times for hallux valgus.

Excision of the head of a phalanx was performed nine times for hammer toe.

Excision of one or more ribs.—All these were for empyema, or its result. Of the twenty-seven cases, twenty-five, including the two fatal cases, were in the medical wards, and are not included in Table I. One of these was an Estlander's operation. The other two cases were—

A man, aged 20, upon whom Estlander's operation was performed five months after the original empyema had been opened. Portions of eight ribs (3rd to 10th) were removed. Much improvement followed, but the original sinus had not quite healed when the patient left the hospital on the fifty-ninth day after the operation. (ii. 2493.)

A woman, aged 48, who had undergone resection of rib two years previously, had had sinuses ever since. Part of a rib was resected; during the operation one blade of a pair of Hoffman's bone forceps broke off into the pleural cavity. Three months later the wound was reopened, and the piece of metal extracted with long curved forceps. The patient was discharged six months after admission with a sinus nearly healed. (iv. 1776*.)

Excision of the wrist.—The only case was that of a woman, aged 20, with tuberculous disease and sinuses of one year's duration. An atypical scraping operation was performed with a good result. (ii. 981.)

OPERATIONS ON BONES.

Osteoclasia was performed ten times for genu valgum, fourteen times for rickety curvature of tibia and fibula, and once for old fracture of radius and ulna, with good results.

Osteotomy—**FEMUR**.—In four cases for ankylosis of the hip, by the infra-trochanteric method, with good results. (Male iv. 661 and 2935; Female iv. 1006 and 1079.)

In one case, through the middle of the shaft for old fracture, with good result. (iii. 1736.)

For genu valgum, twice by supra-condyloid (Mac Ewen's) method (Male iii. 2750, and iv. 1146), once by inter-condyloid (Ogston's) method (Female ii. 2543*), with good results.

In one case of old injury to the knee of a boy, aged 17, part of the projecting internal condyle was removed. (iv. 215.)

TIBIA AND FIBULA.—Once for rickety curvature (Male iii. 1274), and four times for old badly united fractures. (Female i. 2275; Male iii. 2820 and 3749*, iv. 449.)

TARSUS.—Performed twice upon the same patient, upon whom double astragalectomy was also performed. (Female v. 1285 and 2638.)

Erasion or gouging of carious bone was performed twenty-nine times without any bad result; in one case of erosion of the mastoid, the lateral sinus was opened accidentally, but no evil effects followed. (Female iv. 845.)

Sequestrotomy.—Performed forty-four times upon various bones, with two deaths.

A stoker, aged 28, was admitted very ill with necrosis of the femur of ten years' duration, and a temperature of 104°. Very offensive pus was oozing from sinuses in the thigh. The patient had already had two attacks of erysipelas. Shortly after admission, the patient had a rigor. Two days later the sinuses were opened up, much offensive pus evacuated, and some dead bone removed. The symptoms of septicæmia continued after the operation, and rigors occurred frequently. The patient was treated with antistreptococcus serum, but gradually got worse, and died on the sixth day after the operation. The post-mortem showed necrosis of nearly the whole shaft of the femur, and much infiltration of the muscles of the thigh, with foul pus. (i. 3157.)

A boy, aged 15, was admitted for sinuses about the thigh in connection with old disease of the knee, and necrosis of the femur of three years' duration. The urine contained half albumen and some pus. Two operations were done for removal of sequestra. A month after the last operation uræmic symptoms set in, and the boy died a few days later. The post-mortem showed extensive disease of the kidneys. (iv. 607.)

An interesting case was that of a boy, aged 8, with a smooth firm swelling in the iliac fossa, not tender or painful. It had existed about two months. At consultations, opinions were divided between sarcoma and inflammatory disease of the ilium. An exploratory incision revealed about a drachm of pus and a small sequestrum of the ilium. The boy eventually left the hospital with a small sinus. (iv. 178.)

Trephining.—**MASTOID**.—Performed eight times; all the patients recovered; one of these cases also underwent trephining of the skull for cerebral abscess, and is described under that heading. (Female v. 1409.)

OS CALCIS.—A bricklayer, aged 37, was admitted with tuberculous disease of both calcanea, of eighteen months' duration. Both were trephined, a sequestrum being removed from one and some soft tuberculous bone from the other. He made a good recovery, and was completely relieved of his pain. (iii. 2271.)

SKULL.—Five patients were trephined for ABSCESS OF THE BRAIN.

Two recovered.

A female clerk, who had had otorrhœa several years before, was admitted with left otitis media. Until seventeen days before admission she had been in her usual health; on that day she complained of earache; one day before admission she began to be drowsy; this drowsiness rapidly increased. There was no vomiting, shivering or headache apart from the earache. On admission she was semi-comatose with rigidity of the right arm; there was no paralysis, but occasional squint, temp. 99°, pulse between 70 and 54. On the day after admission the mastoid cells were opened and some pus let out. The drowsiness became less marked. On the following day there was distinct paresis of the right leg, arm and face. The temperature had fallen below normal. The patient was then trephined half an inch behind and one inch above the centre of the left meatus. The dura mater was not opened, but lifted up until the upper surface of the petrous bone was reached. Here a small extra-dural abscess was found, and an opening in the dura mater through which a director was passed into a large abscess in the temporo-sphenoidal lobe, an ounce of offensive pus being evacuated. The healthy portion of the sub-dural space was thus not opened. The patient made a steady and good recovery; the drainage tube was removed on the sixty-second day, and the patient left the hospital quite well on the seventy-first day after the operation. (v. 1409.)

A monthly nurse, aged 49, with double otitis media of many years' duration, was admitted with a history that for six months she had been feeling ill, and for about six weeks had had pain in the head. No history of vertigo or vomiting. On admission she had slight left facial paralysis and much offensive discharge from the left ear. The temperature, 101.4° on admission, steadily fell, and after the fifth day remained subnormal. The pulse in the same time fell gradually from 70 to 50, and the patient became more and more drowsy. On the ninth day after admission there was slight paralysis of the right leg, but not of the arm; on this day she was trephined, first over the left temporo-sphenoidal lobe, where nothing abnormal was found, then over the cerebellum on the same side. After cutting through the membranes, about half an ounce of foul pus was evacuated from the cerebellum. The cavity was washed out and drained. The patient made a slow but steady recovery; the tube was removed on the thirty-eighth day, and the patient left the hospital on the sixty-fifth day after the operation quite well, and with the wound healed. (v. 1808.)

Three died.

A girl, aged 15, was admitted with a history of thirteen months otorrhœa from the left ear, nine days vomiting and headache markedly occipital. No rigors, no fits, no paralysis. When admitted she was dull and apathetic, but not unconscious. There was slight optic neuritis. Temperature at first 99°, then 97.8°. Pulse 60 or under. Drowsiness increasing, on the day after admission, trephining was done over the left temporo-sphenoidal lobe, and the brain punctured in several directions; no pus was found. It was intended to explore the cerebellum, but the patient's breathing having stopped, no further operation was performed. Artificial respiration was kept up for three hours, the heart continuing to beat all the time. At the post-mortem, a large tense abscess of the left lobe of the cerebellum was found, displacing and compressing the pons and medulla. (v. 1368.)

A carpenter, aged 35, was admitted to a medical ward for headache. For three months he had been losing flesh; for fourteen days he had had severe and increasing headache, chiefly frontal; for a few days there had been slight vomiting and diarrhœa. There was no history of chronic ear disease nor of rigors, but three days before admission he had been sweating profusely. On admission he was semi-conscious, and in a state of cerebral irritation. Temperature 100.4°, Pulse 76. No squint or other paralysis. No mastoid tenderness. On the following day discharge from the right ear was noticed;

the patient became more drowsy ; no vomiting. Patient steadily became more and more comatose, pulse and temperature falling to below 60° and to 97·4°. On the third day respiration stopped, but the man was kept alive for a time with oxygen and artificial respiration. He was then transferred to the care of the surgeon and trephined over the temporo-sphenoidal lobe, a large abscess in this part of the brain being opened. The patient never recovered consciousness, and died two hours later. At the post-mortem, the abscess was found to be two inches in diameter, and to have a well-marked pyogenic membrane. Its centre was exactly above the external auditory meatus. There were also several small hæmorrhages in the pons, apparently the result of sudden alteration of tension. (v. 1343.)

A woman, aged 21, was admitted to a medical ward for severe headache. For two months she had been slightly deaf in the right ear, but otherwise she had been well until two weeks before admission. Headache then began, followed a week later by pain in the ear and vomiting ; the latter symptom lasted only one day. On admission patient was very drowsy ; there was slight discharge from the right ear, but no pain or tenderness about the mastoid. Pulse, on admission 52, was never above 60 at any time during her stay in the hospital, and was usually below 50. Temperature, 100·2° on admission, gradually fell to subnormal. There was no optic neuritis. The drowsiness gradually increased until on the fifth day the breathing was stertorous and the patient quite unconscious. Breathing then stopped, and patient became blue. For three hours she was kept alive by artificial respiration and oxygen, and a consultation then held with the surgeon. She was then trephined over the right cerebellar fossa, and pus reached by passing an exploring syringe a considerable distance forwards and upwards. The patient died shortly after the operation, having never regained consciousness. The post-mortem showed a right temporo-sphenoidal abscess as large as a hen's egg, the centre of which was immediately over the tympanum. The abscess, although it had been punctured, had not been drained. (Medical Register, Vol. iv. 130, and Medical Statistics.)

For EXTRA-DURAL ABSCESS.—A man, aged 19, was admitted with a history of left otorrhœa for four years, and aural pain and headache for fourteen days ; no vomiting. On admission he was drowsy and irritable ; no discharge from the ear, slight œdema of left mastoid process, marked double optic neuritis ; no paralysis. Pulse 60, Temperature 100·2°. He was trephined at once, about half an ounce of thick greenish pus being let out from between the bone and dura mater. Patient rapidly recovered his senses and his general health, and left the hospital on the fifty-eighth day after the operation ; there was still a small sinus and slight optic neuritis, but in other respects he was quite well. (iii. 2416.)

For CEREBRAL TUMOUR.—A woman, aged 47, was admitted with a history of five months headache and occasional vomiting, seven weeks weakness of right arm and leg, three weeks difficulty in speaking and mental wandering ; in the last few days there had been increasing drowsiness. No fits, no vertigo. On admission, almost completely unconscious ; both pupils small, no squint, marked optic neuritis, some weakness of right arm and leg. The diagnosis was tumour of left side of brain, not cortical ; it was thought that trephining might relieve her symptoms. After the trephining the brain was punctured, the intra-cranial tension being relieved by letting out some serous fluid, probably from the lateral ventricle. After the operation the patient recovered consciousness and was able to speak to and recognise her friends and feed herself ; she then gradually relapsed into her former state, and died on the thirteenth day after the operation. At the post-mortem, a soft gliomatous tumour, two inches in diameter, was found in the substance of the cerebral hemisphere, just behind and a little outside the optic thalamus. In the right temporo-occipital lobe was another smaller growth of similar nature. (v. 1228.)

A woman, aged 26, was quite well until ten months before admission, when she began to be deaf in the left ear, and to stagger in walking. Three months later, her eyesight began to fail the left eye being worse than the right ; about

the same time, left frontal headache began. About two months before admission left deafness began, and since that time she had been rather childish in her behaviour. Never any convulsions or aural discharge; no other serious illness. On admission she was in an irritable, childish condition, quite deaf, with double optic neuritis nystagmus and squint. Tumour of the cerebellum was diagnosed, and the left cerebellar fossa trephined in two places, the underlying brain being punctured in several places. Marked increase of cerebral tension was found, but no tumour could actually be seen, so the wound was closed. Patient gradually got worse, and died on the fourteenth day after the operation. The post-mortem showed a gliomatous tumour as large as a pigeon's egg at the anterior part of the left cerebellar hemisphere. It pressed considerably upon the pons. (v. 2636.)

For FRACTURE OF THE SKULL.

Two patients recovered.

A platelayer, aged 41, knocked down by a train, and admitted with a compound depressed fracture of the frontal bone, made a rapid and excellent recovery, leaving the hospital on the twenty-ninth day after the operation. (ii. 2726.)

A labourer, aged 37, who fell thirty feet on to his head, and was admitted with an extensive wound exposing a depressed fracture of the vault, also made an uninterrupted recovery after trephining. (v. 614.)

Three patients died.

A woman, aged 26, was admitted on the day after having received a blow on the left side of the head from a saucepan. There was a dirty contused scalp wound with a small fissure in the skull. Three days later the temperature rose to 103°, but soon fell again to normal. Similar transient elevations of temperature occurred on two other occasions, but otherwise the temperature was normal. She had slight headache, but otherwise seemed well. On the twenty-ninth day after admission the patient became drowsy, and a few hours later the right arm became paralysed; the face was also partially paralysed. There was no vomiting or headache. Next day she was trephined, pus being found in the diploe, and also forming a localised abscess beneath the bone. The dura mater was not opened. From this time the patient improved; by the third day after the operation the drowsiness and paralysis had diminished. Three days later she suddenly again became drowsy, rigidity set in, and she died comatose on the next day, thirty-seven days after admission. At the post-mortem, a large intra-cerebral abscess was found occupying almost the whole of the left parietal lobe. (iv. 24.)

A meat porter, aged 51, was brought to the hospital, supposed to be drunk; there was a doubtful history of a recent fall. He was comatose, and had marked rigidity of all four limbs, but especially those of the left side. Hæmorrhage upon the surface having been diagnosed from these and other symptoms, the patient was at once trephined over the right temple; no extra-dural hæmorrhage was found, but much blood welled up from the sub-dural space as soon as the latter was opened. The patient never regained consciousness, and died soon after the operation. The post-mortem showed extensive laceration of both frontal and left temporo-sphenoidal lobes and a fracture of the posterior fossa only. There was much blood at the base of the brain. (iv. 3536.)

A man, aged 29, was drunk, and fell five feet into an area on to his head. He gradually became more and more drowsy until about twenty hours after the accident; he was then trephined, being at the time completely unconscious. A linear fracture of the vault was found, but no extra-dural hæmorrhage. The patient was not improved by the operation; he gradually grew worse, and died two days later. The post-mortem showed extensive laceration of the base of the brain, with intra-dural hæmorrhage, chiefly at the base. (v. 3767.)

For THROMBOSIS OF THE LATERAL SINUS trephining over the lateral sinus, with simultaneous ligature of the internal jugular vein, was performed three times; two patients died; one recovered.

A vanguard, aged 17, had been sent to the hospital as a case of typhoid fever and admitted to a medical ward, whence he was transferred on the following day. For three weeks he had been feeling ill, and for eleven days had been laid up with continuous headache. On admission he was very ill with offensive discharge from the left ear and marked swelling and tenderness between the mastoid process and the angle of the jaw. Within a few hours of admission he had a rigor with a temperature of 107.2° , and soon afterwards a second one. On the day of transference trephining was performed and the jugular vein tied; the latter was found to be full of pale yellow clot; the lateral sinus itself was not found to be thrombosed at the place where it was opened, and it had to be plugged. After the operations rigors and other signs of septicæmia continued, and he died five days later. At the post-mortem, numerous pulmonary infarcts and abscesses were found, and the internal jugular vein contained foul pus below the seat of ligature. (ii. 3099.)

A man, aged 20, was admitted with a history of five years chronic otorrhœa; two days before admission a polypus had been removed from one ear; he had had much pain since. On admission he had a flushed face and was slightly drowsy; temperature 103° . On the following day the mastoid was trephined and some pus let out; no improvement followed; rigors occurred frequently, the temperature being alternately very high and very low. On the third day after admission the wound was re-opened and the tympanic cavity scraped out. The lateral sinus was exposed, found blocked with septic clots, and tied. Eight days later still, the patient's condition being unaltered, it was thought just possible that a cerebral abscess might be present, so trephining was performed over the temporo-sphenoidal lobe and the brain punctured in several directions. No pus was found, the rigors continued, signs of pleurisy developed, and the patient died on the twenty-ninth day. There was no post-mortem. (iv. 1753.)

A schoolboy, aged 15, was admitted with the history that for three weeks he had had earache and for three days delirium and vomiting. On admission his temperature was 103° , and he looked very ill. He was found to have had chronic otorrhœa; both membranes were incised and pus let out. On the fourth day after admission he had a slight rigor and complained much of pain about the back of the head and neck, which were kept very rigid. Two days later another rigor, and as the temperature indicated thrombosis of lateral sinus, the skull was trephined and the sinus opened, the jugular vein being also tied in the neck. The latter vein was found to contain discoloured clot, although no actual pus was seen. The temperature fell below 100° for two days, then returned to 103° and 104° , with daily falls below normal, and daily rigors. This lasted five days; then the temperature became normal, and remained so until the patient left the hospital on the fiftieth day after admission, quite well, and with the wounds healed. (ii. 2769.)

For JACKSONIAN EPILEPSY trephining was performed twice, both patients recovering.

A girl, aged 9, had eleven weeks before admission received a slight blow on the top of the head, followed by vomiting, headache and some loss of consciousness; six weeks later twitching of the face began and continued ever since; recently it had spread to the right arm and leg. There was some loss of power in the right arm. There was never complete loss of consciousness. On admission, no local sign of injury to the skull. She was trephined over the middle of the left Rolandic fissure. The dura mater seemed quite normal and was not opened. The patient recovered rapidly from the operation and the spasms were afterwards somewhat less frequent. (ii. 2477.*)

A boy, aged 15, had six and a half years before admission been knocked down by an engine and sustained a comminuted fracture of the skull; an operation had been performed at another hospital and some pieces of bone taken away. He recovered from this operation and remained well until five months before admission, when he first began to have fits, increasing in frequency. On admission his general health was good; in the right motor area and in front of

it was a considerable irregular area of skull in the centre of which pulsations of brain could be felt. In the first four weeks after admission he had two fits, both affecting the left side of head and face, one fit with loss of consciousness, one without. He was trephined over the right arm centre, and a small cyst, containing clear fluid, was found and removed. It had formed a distinct depression in the brain. The boy made an excellent recovery, had no more fits, and left the hospital on the fifty-first day after operation. (iii. 2774.)

EXPLORATORY TREPHINING.—A boy, aged 5, had had for four years discharge from the left ear; two months ago he fell and struck his head; five days ago the discharge from the ear stopped. On the following day patient became drowsy and complained of pain in the head. Two days later he was quite unconscious, and twitching of the right arm and leg and some squint set in. On admission general tuberculous meningitis was diagnosed, but as it seemed possible that there was also an extra-dural abscess connected with the ear, the patient was trephined behind the left ear and the brain examined; no pus was found, and the child died on the day after admission. The post-mortem showed extensive tuberculous basal meningitis not directly connected with the middle ear, which was suppurating, although there was no disease of the bones. There was also early tuberculous disease of the appendix vermiformis and neighbouring mesenteric glands, but this was not directly connected with the death. (iv. 2993.)

Another boy, aged 12½, was admitted to a medical ward with tuberculous meningitis. An exploratory trephining was performed on the fourth day, and both temporo-sphenoidal and cerebellar lobes punctured, but no pus found. The boy died next day, and the post-mortem showed extensive basal meningitis and miliary tubercle. (Medical Register iv. 160, and Medical Statistics.)

A woman, aged 34, was admitted with a history that for four days she had been drowsy and had had pain in the left ear. There was no history of injury, but a small suppurating wound was seen on the scalp. On admission she was almost comatose, with a temperature of 105°. There were convulsive movements of the right hand, and inequality of the pupils. Although there was no local evidence of disease of the ear, it was considered that the symptoms might be due to intra-cranial suppuration. The patient, who was desperately ill, was trephined over the temporo-sphenoidal lobe and over the lateral sinus, but nothing abnormal was found, and the patient died on the day after admission. The post-mortem showed no disease of the brain; the case was one of acute septicæmia, due to the small wound on the scalp. (iv. 1787.)

Another case of trephining for possible cerebral abscess is described under trephining for thrombosis of lateral sinus. (iv. 1753.)

ELEVATION OF COMPOUND DEPRESSED FRACTURE.—Two boys, aged 11 and 15, who had been kicked by horses, were admitted with extensive fractures and much laceration of brain. One case died an hour after the operation, the other on the second day. (ii. 3297, and iii. 719.)

The third patient, a navy, who had been struck on the head by a revolving capstan, made a rapid and excellent recovery. (iv. 3170.)

Wiring fractured bones.

HUMERUS.—A printer's boy, aged 16, was admitted with a bad compound comminuted fracture of the arm, involving the elbow joint, and accompanied by much laceration of soft parts; he had been crushed in a printing machine. An attempt was made to save the arm; on the day of admission the fragments were united by three wires; sloughing of the ulnar nerve and necrosis of the humerus followed, and amputation at the shoulder had to be performed eight weeks later. The boy then made a rapid recovery. (v. 2483.)

OLECRANON.—The case was that of a woman, aged 36, with an ununited fracture of five months' duration. (iii. 2454.)

PATELLA.—Primary wiring was performed twice, secondary wiring once.

A porter, aged 29, was admitted on the day of the accident with a simple transverse fracture of the patella; on the eighth day a wiring operation was done through a transverse incision; two silver wires were placed sagittally through the fragments. The joint was drained for two days, and the patient made an uninterrupted recovery, getting up on the twenty-fifth, and leaving the hospital on the thirty-first day after the operation. When seen again three weeks later, the movements of the joint were good, but the patient was complaining of pain; the wire could be felt projecting beneath the skin. When last seen, a year later, his condition was excellent; the knee was practically as good as before the accident; the patient could bend it freely, and could walk and climb ladders without difficulty; the wire could still be felt. (v. 3045.)

A gasfitter, aged 29, was admitted with a transverse fracture of the patella, caused by falling off a bicycle fourteen days previously. Four days after admission, the patella was wired by the open method, two silver wires being passed sagittally through the fragments. The wound healed by first intention, and the patient was discharged on the thirty-second day after the operation, wearing only an elastic bandage upon the knee, and able to move the knee well. (v. 1284.)

A woman, aged 30, had broken her patella ten months previously. On admission the two fragments were $1\frac{1}{4}$ inches apart and united by a thick band of fibrous tissue. This was cut away, and the fragments united by silver wire passed sagittally through them. The wound healed by first intention, and the patient left the hospital on the thirty-seventh day after the operation. Three months later she was re-admitted for a splint; the patella was then firmly united, and could be moved laterally; the knee could be flexed a little; the patient was complaining of some pain in the knee, and the ends of the wire could be plainly felt beneath the skin. (iv. 354, and 1268.)

A coal porter, aged 29, had had his patella wired coronally thirteen months previously, fifteen days after the original fracture. The wound had healed by first intention, and the wire had caused no trouble until nine weeks before admission, when it became inflamed, and a sinus formed. The wire was removed and the patient made a good recovery. There was half an inch of separation between the fragments. (ii. 1162.)

Bone grafting.—A female costermonger, aged 15, admitted for extensive necrosis of the femur two months after scarlet fever, underwent three operations for the removal of dead bone in the course of as many months. Six weeks after the last, the large cavity in the femur was scraped and filled up with bits of decalcified bone (a Senn's plate cut up). Two months later the patient was discharged in good condition, but with a sinus still open. (iv. 1877*.)

OPERATIONS ON JOINTS.

There were no deaths or any other bad results after any of these operations.

AMPUTATIONS FOR INJURY.

No death occurred after any of the twenty primary and secondary amputations for injury.

A man, aged 38, had put his arm into a chaff cutting machine, which had cut the arm into successive sections one inch wide as high as within two inches of the elbow. He made an excellent recovery after amputation through the middle of the arm. (iii. 3548A.)

A labourer, aged 42, over whose leg a tramcar had passed, underwent primary amputation through the upper third of the leg. The operation was followed by secondary hæmorrhage on the second and eighth days, and the patient became maniacal. He was eventually sent insane to an infirmary on the sixty-seventh day after admission. (i. 2897.)

A compositor, aged 50, was run over by a cart. Primary amputation of the toes was followed by sloughing of the flaps and secondary amputation through the upper third of the leg on the thirty-second day. The stump healed well, but the patient, when discharged, was the subject of melancholia. (i. 2348.)

The case of secondary amputation at the shoulder, eight weeks after the wiring of a bad compound fracture of the humerus, has been described under wiring of fractures. (v. 2483.)

A carman, aged 38, was thrown from a van, the wheel passing over his left hand and causing a simple fracture of the forearm and an extensive lacerated wound of the hand, a large flap of skin being stripped up. The wound, which was extremely dirty, was cleansed as far as possible, sewn up and drained. The flap sloughed, and the hand was then treated with fomentations. On the eleventh day, stiffness of the jaws and abdominal muscles was first noticed, and on the following day, the diagnosis of tetanus being quite clear, amputation was performed through the middle of the forearm, partly for the tetanus, and partly because the local condition seemed hopelessly bad. Injections of antitoxin were begun immediately after the amputation, from $\frac{1}{2}$ to 2 grammes being injected almost daily for fifteen days. During this time the symptoms of tetanus continued, but were never very severe. The injections were discontinued after the fifteenth day on account of the fever produced by them. The risus sardonicus did not wholly disappear until the twenty-first day. The patient made a gradual recovery, and left the hospital on the fifty-third day. (iii. 752.)

AMPUTATIONS FOR DISEASE.

Out of forty-seven amputations for disease, six deaths occurred.

Through the scapula.—A cabman, aged 48, was admitted with a large fungating and suppurating sarcoma of the muscles about the shoulder. It had been noticed about six weeks. The subclavian artery and vein were tied, the arm and tumour then removed, and finally a portion of the scapula. The patient made a slow but good recovery, and left hospital on the forty-seventh day after the operation. The tumour was about four inches in diameter, and sprang from the connective tissue behind and beneath the deltoid muscle. (iii. 448.)

Shoulder.—Performed upon a woman, aged 36, for infantile paralysis, the whole arm being withered and useless. A good recovery followed. (iii. 1083.)

Also upon a man, aged 38, for a periosteal sarcoma. Two months before admission he had "wrenched his arm." For one month he had had pain and swelling. There was an ill-defined swelling at the upper part of the humerus. The patient made a rapid recovery, and left the hospital on the eighteenth day after the amputation. (v. 3483.)

Arm.—A married woman, aged 36, was admitted for gangrene of the hand and forearm. Fourteen days before admission she cut her thumb, four days later cellulitis of the hand set in and spread gradually up to the shoulder and neck. Three days before admission incisions were made into the forearm. The patient grew rapidly worse, and was admitted with gangrene up to the middle of the forearm; above this was cellulitis, extending on to the chest and neck. The patient was very ill. Amputation was performed just below the shoulder, and the patient made a rapid and excellent recovery. The highest temperature during her stay in the hospital was 99°. (i. 2781*.)

A girl, aged 14, was admitted with tuberculous disease of the spine and of the finger, elbow and shoulder on the same side, together with extensive ulceration of the skin of the arm. The disease had lasted many years. Amputation through the arm was followed by an excellent recovery. (iv. 732.)

The third case was an amputation for tuberculous elbow in a man, aged 52, followed by a good recovery. (i. 3247.)

Forearm.—Performed with a good result upon a man, aged 52, for extreme contraction of the hand after old cellulitis. (iii. 3539*.)

Thumb and fingers.—These amputations were performed in twelve cases for necrosis and other results of inflammation, in two cases for gangrene, and once for supernumerary digit.

Amputation of a supernumerary lower limb.—A girl, aged 6, was admitted with tuberculous disease of the tarsus and double talipes; she was treated by scraping, and subsequently by excision of the astragalus, with a good result. The chief interest of the case, however, lay in the presence of a supernumerary lower limb, about half the length of the normal lower limb. It sprang from the lumbar region close to the middle line and hung down over the nates. An irregular mass of bone represented the os innominatum, the femur and tibia measured respectively $7\frac{1}{2}$ and $6\frac{1}{2}$ inches in length. The other bones of the limb were less well developed. The limb was amputated with a good result. (v. 1506.)

Hip.—A schoolboy, aged 14, was admitted with acute hip disease of two weeks' duration. He was thin and ill, and had an abscess in front of the hip, which was opened two days after admission. Ten days later the joint was opened and drained, and the head of the femur found to be carious. Eleven weeks later excision of the hip was performed through an anterior incision; eleven days later an incision for drainage was made in the buttock. Two months later, the boy having been getting steadily worse since admission, amputation at the hip was performed. The operation was done by a modification of Furneaux Jordan's method, the vessels being clipped and tied as they were cut. During the operation much pus ran away from the pelvis through the sciatic foramen. The wound was sewn up and drained. The boy recovered quickly from the operation, then began to vomit and became very restless. His temperature rose again, and he died forty-eight hours after the operation, and one hundred and sixty-one days after admission. The post-mortem showed extensive suppuration within the true and false pelvis, but no perforation of the acetabulum. The whole of the amputation wound was bathed in foul pus. (v. 1749.)

Thigh.—A laundress, aged 22, and a milliner, aged 18, both made good recoveries after amputation through the upper third of the thigh for PERIOSTEAL SARCOMA of the lower end of the femur. The disease had been noticed eight weeks and five months respectively. Six months later (in the following year) the former was again in the hospital with recurrence in the stump, and underwent amputation at the hip, and about the same time the latter was found to have, apparently, recurrence in the muscles of the thigh. When last seen the general health of each was good. (v. 2272 and 2246.)

A man, aged 38, who had already undergone five operations for the local removal of a SPINDLE-CELLED SARCOMA of the thigh, and on whom on one of these occasions the superficial and deep femoral arteries and the femoral vein had all been tied simultaneously (see Surgical Report for 1894, p. 136), was re-admitted with extensive recurrence necessitating amputation through the upper third of the thigh. The operation was followed by recurrent hæmorrhage, which continued for several days, and the wound had to be re-opened on the fifth day. The patient then made a good recovery. (i. 1247.)

A boy, aged 11, made an excellent recovery after amputation through the middle of the thigh for TUBERCULOUS KNEE. (iv. 1255.)

A coal carman, aged 30, was admitted with TUBERCULOUS DISEASE of the knee of two years' duration. On admission the patient's general health seemed fairly good, but the knee was in a very bad state. There was no external suppuration, but there was great swelling of synovial membrane, with little

fluid in the joint and little pain. After two months' treatment by rest, excision of the knee was performed and the bones united by steel pins. The bones were found to be much eroded, and there was an abscess in the popliteal space; the wound had to be drained. Sinuses persisted, fresh abscesses had to be opened from time to time and the patient gradually lost ground. Six months after admission night sweats became troublesome and albuminuria began. Intermittent and rather profuse hæmaturia then occurred, due probably to tuberculous disease of the kidneys. At the end of the eighth month amputation through the middle of the thigh was performed, but the patient did not improve, he gradually sank and died two months later. There was no post-mortem. (iv. 3578.*)

A cabman, aged 54, made a good recovery after amputation through the lower third for an **EPITHELIOMA** engrafted on a chronic ulcer of twenty-one years' standing. (iv. 1920.)

A boy, aged 7, made a good recovery after a similar amputation for **CHRONIC ULCER AND CONTRACTION** of the knee following a scald two years previously. (iv. 88.)

Four amputations through the lower third were performed for **GANGRENE**, with two deaths.

A lithographer, aged 34, had always suffered from cold hands and feet. Eight months ago he had had an attack of left hemiplegia. Six days before admission both feet became cold, numb, blue and tender. On admission the toes of the right foot were in a state of dry gangrene; this gradually spread up to the middle of the leg. In the left foot there was no actual gangrene, and the circulation gradually became re-established. On the twenty-ninth day after admission, a line of demarcation being well marked, temperature and pulse rising and the patient in much pain, amputation was performed and the patient made a rapid and excellent recovery, leaving the hospital twenty-six days later. In this case the gangrene was considered to be of embolic origin. (iv. 13.)

A feeble engine driver, aged 67, was admitted with senile gangrene of four toes, with much redness, œdema and pain. The gangrene slowly spread and patient became delirious. On the forty-second day after admission amputation was performed. A rapid and excellent recovery followed and the patient left the hospital quite well on the forty-third day after the operation. (ii. 1046.)

A man, aged 55, was admitted with senile gangrene of the toes of seven weeks' duration. It slowly spread and the patient became delirious. Forty-one days after admission amputation was performed, but the patient sank and died next day. The post-mortem showed extensive atheroma and occlusion of all the main arteries below the knee on both sides. (iii. 1329.)

A gardener, aged 69, was admitted with senile gangrene of four months' duration, involving two toes. The gangrene slowly spread and the patient became so ill that on the fifteenth day amputation was performed. The patient never rallied, and died a few hours later. The post-mortem showed extensive calcification of arteries and thrombosis as high as the popliteal. (v. 2038.)

For **MALIGNANT DISEASE** of the leg amputation in the same situation was performed upon three patients.

A woman, aged 34, with a round celled sarcoma as large as an orange, springing from the anterior annular ligament of the ankle; it had existed three years. (iii. 828.)

A traveller, aged 44, with a large fungating mycoid sarcoma of the head of the tibia of two years' duration. (v. 3213.)

A woman aged 63, with an epithelioma of the leg. (v. 615.)

All three made excellent recoveries.

For TUBERCULOUS DISEASE of the knee the amputation was performed five times upon male patients, aged 30, 14, 31, and 10, for disease of two years, sixteen months, two years, and five years' duration (i. 2691, ii. 1610, 3502*, iv. 979), and upon a woman, aged 62, with disease of four years' duration (iii. 2394.*). It was also performed upon a solicitor, aged 60, for tuberculous disease of the tarsus of forty-two years' duration (ii. 789). All six made good recoveries.

Through the knee, by Stephen Smith's method, amputation was performed once upon a tailor, aged 60, who had had diabetes for ten years and perforating ulcer of the foot on and off for two years. He was admitted with cellulitis of the leg, and a patch of gangrene soon appeared on the leg. The patient gradually became worse, so on the forty-eighth day after admission the amputation was performed, but the patient sank and died nine days later. (iii. 2490.)

Leg.—Three men and one woman made good recoveries after amputation for CHRONIC ULCERS. (Male i. 1654, iv. 1155, 1967; Female i. 534.)

For GANGRENE two amputations were performed, with one death. A woman, aged 21, was admitted to a medical ward on what was supposed to be the sixteenth day of typhoid fever. She was very ill. Thirty days later she was suddenly seized with pain in the foot, and pulsation ceased in the popliteal artery. Dry gangrene set in and slowly advanced. Forty-four days later, when a line of demarcation was present in the middle of the leg, amputation was performed below the knee. A little sloughing of the flaps took place, but the wound was soundly healed by the time the patient left the hospital, nine weeks after the amputation. (iv. 2915*.)

A woman, aged 60, was admitted with dry gangrene of two toes of three months' duration. The gangrene gradually spread, temperature began to rise, and the general condition, which at first was good, became seriously affected. On the twenty-sixth day after admission amputation was performed just above the ankle but the flaps sloughed, the patient became delirious and gradually sank and died on the fifth day. No post-mortem. (ii. 1721.)

For EPITHELIOMA of the leg and RECURRENT SARCOMA of the foot amputation was performed with good results upon a man, aged 67, and a woman, aged 43. (iii. 3210* and ii. 1956.)

Foot.—Syme's amputation was performed with success upon each of the following nine patients.

A woman, aged 65, with an UNREDUCED SUBASTRAGALOID DISLOCATION of nineteen weeks' duration. (iv. 2215.)

An unhealthy man, aged 59, with calcareous arteries and SENILE GANGRENE of part of the foot. For nearly two years the disease had been in progress and some of the toes had already separated. Part of the flap sloughed and the stump healed very slowly. The man left the hospital seventy-two days later with a small sinus still present. (iii. 1650.)

Four male and three female patients, aged 15, 24, 20, 34, 27, 11 and 16 years respectively, with TUBERCULOUS DISEASE of the ankle or tarsus of duration of from eight months to six years. (Male ii. 2134, iv. 811, 3111*, v. 67; Female iii. 1156, iv. 2773*, v. 2750.)

Roux's amputation was successfully performed for SARCOMA of the muscles of the foot upon a man, aged 27 (i. 348); and for TUBERCULOUS DISEASE of the tarsus upon male patients, aged 8 and 46. (i. 1764, 2714.*)

Toe.—Performed nine times for HAMMER TOE and once for TUBERCLE of a metatarsal bone.

Penis.—A man, aged 60, with EPITHELIOMA, underwent complete amputation through the crura (Thiersch's operation), became delirious immediately after the operation, gradually sank and died fifteen days later. The operation was complicated by the presence of a very large irreducible scrotal hernia. (i. 60).

OPERATIONS ON THE BREAST.

Inflammatory affections.

Two women, aged 18 and 45, underwent partial amputation for chronic mastitis; in the latter case the disease was probably tuberculous. (ii. 625, iii. 1210.)

A woman, aged 39, was admitted with a tumour of the breast of five weeks' duration, of doubtful nature. The whole breast was removed, and the axilla cleared, but no enlarged glands were found; at the time of operation, the disease was thought to be duct carcinoma, but subsequent examination showed it to be inflammatory. (iv. 2834.)

A stout woman, aged 67, was admitted for a swelling of the breast, which had been noticed two months; for three weeks the nipple had been retracted; there was no pain. In the substance of the breast was a rounded hard mass, about two inches in diameter. The skin was a little adherent, and slightly red, and the nipple was markedly retracted; there was no enlargement of glands. The breast was removed, and the tumour found to be an inflammatory mass with numerous small points of suppuration scattered through it. The patient made an excellent recovery. (ii. 2112.)

Galactocele.—Three women, aged 28, 27 and 40, underwent local removal of galactocele. (i. 1302, ii. 1741, 1825.)

Amputation of whole breast for Carcinoma.—Fifty-six women and one man underwent this operation; in forty-nine of these cases the axillary glands were also removed. Two patients died; all the others made good recoveries.

A woman, aged 58, had first noticed the tumour two and a half years ago; six weeks ago the skin ulcerated, and four weeks ago hæmorrhage occurred. The woman looked healthy, but almost the whole surface of the left breast was occupied by a fungating and sloughing ulcer; the growth was firmly fixed to the pectoral muscle; there were enlarged glands in the axilla. The whole breast was removed, together with most of the pectoralis major and the axillary glands. The wound had to be covered by twisting a flap over it; even then, there was much tension. On the day after the operation, the patient became much excited; this condition gradually passed by the fifth day into one of acute delirious mania. The flaps sloughed, and death occurred on the eleventh day after operation. The temperature after operation was generally about 100°, but just before death it rose to 105°. There was no post-mortem. (iii. 2598.)

A woman, aged 55, was admitted with very bad carcinoma of eighteen months' duration. For one year the tumour had been ulcerated, and one month before admission serious hæmorrhage had begun. After consultation, it was decided to remove the breast, mainly on account of the hæmorrhage. The operation was an extensive one, and the patient gradually sank, and died nineteen days later. There was no further hæmorrhage. (iv. 1240.)

A woman, aged 65, was admitted with a large fungating tumour of the breast of two years' duration; a lump as large as a pea had been present for seven years longer. The tumour was thought to be a serocystic sarcoma, but proved to be a colloid carcinoma. The whole breast was removed very freely,

but the glands were not touched, as they were only slightly enlarged, and were believed to be inflamed. During the operation the pleura was punctured, but no harm followed. The patient made a good recovery, and left the hospital twenty-one days after the operation. (v. 1437.)

The only male case was that of a carman, aged 41; the patient was subsequently re-admitted with recurrence. (iv. 3523*. See Appendix to Table I., page 111.)

Partial amputation for Carcinoma was performed upon eight women, in four cases with removal of glands (i. 1340, iv. 568, 1352, 1572); in four cases without (i. 1453, 2334, ii. 2035, iv. 319.) All made good recoveries.

Local removal of Carcinoma.—The only case was that of a woman, aged 53, with a small nodule as big as a pea just under the skin; microscopically, carcinoma and breast tissue were found in it. The woman left the hospital three weeks later. (i. 1578.)

Local removal of recurrent Carcinoma was performed twelve times, with one death.

A woman, aged 62, who had undergone amputation of the breast and removal of axillary glands four and a half years previously, was re-admitted for a recurrent tumour in the axilla, as large as a walnut. This was removed. After the operation the patient vomited nearly every day, then became gradually more and more drowsy, and finally died on the twenty-eighth day after the operation. The highest temperature after the operation was 99.6°, and for the last three weeks was markedly subnormal. At the post-mortem, no sufficient cause for death was found. There was no trace of malignant disease in the pectoral muscle, or in any lymphatic gland, or in any other part of the body. (iv. 204.)

A woman, aged 62, whose breast had been removed for carcinoma in the hospital eleven years previously, was re-admitted with recurrence in the scar, and in the axilla. She had been perfectly well until eight months before, when recurrence was first noticed. The tumour, as large as an orange, was removed, together with a somewhat smaller mass in the axilla. Microscopic examination showed scirrhous carcinoma of a bad type. The original tumour was "a lump of scirrhous carcinoma as large as a walnut, slightly adherent to the skin; it had been noticed two months before operation. The whole breast was removed, together with the axillary glands; the tumour presented the ordinary characters of scirrhous carcinoma," but the notes did not definitely mention any microscopic examination. (iii. 2125.)

A woman, aged 42, who had undergone several operations for scirrhous of the breast during the last seven years, was re-admitted with a small recurrent nodule in the scar, and a mass of axillary glands. Both tumours were removed freely, the axillary artery and vein being both tied. The patient made a good recovery, and left the hospital fifteen days after the operation. (v. 1922.)

Amputation of whole breast for Duct Carcinoma was performed once upon a woman, aged 47, with a small tumour close to the nipple, and no enlarged glands; blood had been noticed oozing from the nipple three months before admission. (i. 1737.)

Partial amputation for Duct Carcinoma was performed once upon a man, aged 36. (i. 2447.)

Adenofibroma.—A married woman, aged 25, who had never been pregnant, was admitted with an apparently uniform enlargement of one breast. It had been gradually and painlessly enlarging for eighteen months, and was about three times as large as the opposite breast. The tumour was at first thought to be simple hypertrophy, and the whole breast was removed. It proved, however, to be one huge adenofibroma, the breast being spread out in a thin layer over it. (iv. 2006.)

REMOVAL OF TUMOURS.

Cysts.—Of ten cases in which dermoid cysts were removed, in one, the tumour was in front of the manubrium sterni (Male v. 2589); in one, at the umbilicus (Male ii. 1852); in three, in the orbit (Female i. 977, iii. 1054, Male v. 2284); in five, in the neck (Female ii. 1734, 2876*, Male ii. 2597, iv. 2642, and i. 2456); the last was a man, aged 37; eighteen months before admission, he had noticed a small lump near the left angle of the jaw; this gradually enlarged, and for one month it had been painful and much larger. It was tapped, and half a pint of brownish fluid evacuated; the tumour was subsequently dissected out, with an excellent result. (i. 2456, and also i. 2205.)

Adeno-chondro-fibroma.—Both in the parotid (Male iii. 407, v. 993).

Adenoma.—One in the upper lip of a man, aged 54 (i. 2049); one in the scalp of a woman, aged 55 (i. 2876); one in the palate of a woman, aged 40 (i. 2825*).

(See also adeno fibroma, under Operations on the Breast.)

Angeio fibroma.—There were two cases of angeio fibroma of the naso-pharynx; both made excellent recoveries.

A boy, aged 11, had nine months before admission first noticed deafness and obstruction of the nostrils; about this time he also had one attack of epistaxis, but had none since. Six months later a "polypus" was removed at another hospital, and a naso-pharyngeal growth was then first noticed. On admission, he had a large firm smooth tumour of the naso-pharynx, easily seen and felt behind the soft palate. The palate was split, and the growth removed with scissors. It was found to spring from the base of the sphenoid, and had caused much absorption of surrounding bones. The growth after removal was found to be two inches in diameter, and to be a lobulated firm fibroma with numerous blood vessels. The hæmorrhage, which was smart at the time of operation, was easily checked. The boy made a rapid recovery. (i. 3319).

A mason, aged 19, had had for five months obstruction of the nostrils, and for four months, attacks of epistaxis. On admission, a growth could be seen through the anterior nares, and felt behind the palate. The palate was split, and the growth shelled out with scissors and fingers. There was much hæmorrhage at the time of operation, and oozing for some hours afterwards. The wound had to be plugged. Three days later an attack of facial erysipelas followed, but the man made an excellent recovery. (v. 52.)

Enchondroma.—There were two cases; one was a man, aged 22, with a soft myxo chondroma of the upper end of the humerus, as large as a hen's egg; it had been growing two years. (v. 2885.) The other was a man, aged 29, with an enchondroma of the submaxillary gland. (iv. 825.) Both were removed with complete success.

Fibroma.—Of thirteen cases, in eight the tumour sprang from the upper or lower jaw (epulis), and in four, from the back of the neck, finger, buttock and leg, respectively. The thirteenth case was that of a woman, aged 21, admitted for a smooth firm elastic tumour of the inguinal region, about as large as a hen's egg; it had been noticed only six weeks. It was removed, and proved to be a pure fibroma growing from the conjoined tendon. (v. 2905*.)

Lipoma.—In the nineteen cases, the situation of the growth was as follows: abdominal wall (one), bend of elbow (one), forearm (one), back or shoulder (seven), neck (four), buttock (two), thigh (two), and popliteal space (one).

Lymphadenoma.—Three cases, all masses of growth in the neck. In one case the operation was performed twice. (Male ii. 2718.)

Lymphoma.—A girl, aged 6, was admitted for a curious tumour of the soft palate. It had been first noticed only a few days previously. Attached to the soft palate and right tonsil was a hard irregular red mass, as large as a small hazel nut. It was freely moveable, and had a well marked pedicle, so long that the growth usually lay upon the tongue. The growth was removed with scissors, and when examined microscopically, proved to be purely lymphoid in structure, exactly like the tonsil. (iii. 2106.)

Nævus.—In the seven cases, the situation of the nævus was as follows : axilla (one), cheek (one), finger (one), knee (one) nose (two), and under the vertebral border of the scapula (one). (v. 2430.)

Osteoma.—In the eleven cases the situation of the growth (exostosis) was as follows : auditory meatus (one), skull (one), first rib (one), scapula (one), ulna (one), ilium (one), femur (one), tibia (three).

Polypi.—A boy, aged 16, who had been in the hospital on two previous occasions (1890 and 1893) for the same disease, was re-admitted for pain and hæmorrhage, due to multiple rectal polypi. The whole interior of the rectum, as far could be seen or felt, was studded with polypi varying in size from that of a hazel nut downwards. About fifteen were tied and removed, and the boy was much relieved by the operation. (i. 2307.)

In none of the above 127 cases of removal of innocent tumour did a death occur.

Bronchocele.—Six cases of INNOCENT BRONCHOCELE were treated by intra-glandular enucleation. Five recovered.

A woman, aged 43, had had a goitre for 30 years; it had gradually increased in size, especially in the last three years. On admission there was a considerable bilateral nodular goitre; the left lobe consisted of a soft rounded mass as large as an orange. This was enucleated; there was considerable hæmorrhage, and the wound had to be plugged. Some collapse followed the operation, but the patient then made a rapid recovery and left the hospital twenty-five days after the operation. The growth was a solid adenoma, not very well encapsuled. (v. 221.)

In the case of a man, aged 20, the enucleation of a small cystic adenoma was followed by some recurrent hæmorrhage a few hours afterwards. The wound had to be re-opened, but the patient made a good recovery. (v. 586.)

A barmaid, aged 37, had had for two years a gradual enlargement of the right lobe; there was no dyspnœa or other trouble. Several small cysts were removed by enucleation; primary union occurred, and the patient left the hospital eleven days after the operation. (v. 1188.)

The other two cases were a man, aged 36, with a small cyst in or near the isthmus (v. 660), and a woman, aged 47, with an adenoma of nine years' duration as large as a walnut (ii. 1599). Both made excellent recoveries.

One patient died. A woman, aged 26, had had for four years a swelling of the thyroid with some dyspnœa, especially at night. She was a healthy young woman, with a cystic adenoma as large as a hen's egg at the lower part of the right thyroid lobe. When quiet she had no stridor, but after exertion, or on taking a deep breath, the tumour descended behind the sternum, and caused audible stridor. When the tumour was in the latter situation there was no visible tumour. Intra-glandular enucleation was performed; the operation lasted only a few minutes, but in the course of it, the patient stopped breathing and could not be brought round again, in spite of tracheotomy and all other efforts to restore her. The cessation of respiration occurred just at the moment when the tumour was being enucleated with the finger. (ii. 1178.)

One case of PARENCHYMATOUS GOITRE was treated by extirpation. The patient was a man, aged 19, with a bilateral goitre of considerable size, and a good deal of stridor and dyspnoea. The right lobe was extirpated by Kocher's method, and the patient made an excellent recovery, leaving the hospital seventeen days later. (v. 1082.)

MALIGNANT GOITRE.—One case was treated by partial enucleation. A road surveyor, aged 45, was admitted on account of pain and weakness in the left arm and a tumour in the neck. Since the age of 3 he had had a simple goitre involving chiefly the left lobe of the thyroid gland. It had been growing very steadily and slowly all his life, but he was not aware of its having become appreciably larger during the last year. For eight months he had had much pain in the left side of the face and down the left arm, and the latter had become weak. For four weeks he had had to discontinue work on this account. On admission he was a thin, but not unhealthy looking man. Involving the left lobe only of the thyroid, and displacing markedly the larynx and trachea, was a very hard globular nodular mass as large as a man's fist. The tumour moved only slightly on swallowing, the carotid was displaced outwards; the left vocal cord appeared to be paralysed, but the examination of the larynx was very difficult on account of its displacement. There was some stridor on exertion. There was much weakness of most of the muscles of the arm and forearm, and reaction of degeneration was present in many of them. An oblique incision was made over the tumour, and an encapsuled mass as large as a duck's egg was removed; it comprised about one-third of the lobe, the remainder being partially calcified and very fixed. Bleeding was very profuse, and the wound had to be plugged. After the operation the temperature was 100° to 101° for the first six days, and the pulse between 100° and 140°; after this time both became normal. The plugging was removed after twenty-four hours, and the patient left the hospital eighteen days after the operation, having recovered from the operation. The tumour had the character of a so-called malignant adenoma (carcinoma). (v. 3437.)

Epithelioma—CHEEK.—One of these cases was that of a man, aged 55, who made an excellent recovery after the removal of a growth of the inside of the cheek, together with a large mass of glands in the neck and a portion of the internal jugular vein. (iii. 631.)

SCROTUM.—A chimney-sweep, aged 51, was admitted with recurrence, the primary growth having been removed seven months previously; the whole duration of the disease was four and a half years. A very free removal of the disease was performed, the whole of the scrotum and both testicles being also taken away. (i. 381.)

All three patients with epithelioma of the scrotum were chimney-sweeps.

TEMPLE.—A soldier, aged 19, was admitted with an epitheliomatous ulcer in this region, measuring three inches by two. It had existed rather more than two years. Microscopic examination showed squamous epithelioma; The growth was freely removed, together with an affected lymphatic gland. the patient made a good recovery. (v. 3657*.)

Sarcoma—BACK.—The most curious case was that of a man, aged 48, who had had a tumour in the back for nine years; in the last twelve months there had been more rapid growth. Near the middle of the back was a flat slightly raised well-defined dark reddish growth measuring one and a half inches by three. The tumour was removed, and the pathologist reported that the microscopic appearances could not be distinguished from those of sarcoma; in the opinion of others who saw the sections, the characters were rather those of chronic inflammation. (iii. 1075. See also drawing in the Museum.)

INGUINAL REGION.—A tailoress, aged 37, had had for six years a small lump in the left inguinal region. In the last twelve months it had grown

rapidly. On admission, there was, exactly in the region of an inguinal hernia, an oval firm slightly moveable mass as large as a big lemon; it closely resembled an omental hernia. It was removed, and proved to be a soft sarcoma growing apparently from the round ligament. The patient did well until the sixth day after the operation, when she had an attack of pulmonary embolism; at the same time the right femoral vein became thrombosed. On the eighth day the patient died suddenly. At the post-mortem, the wound was found to be nearly healed. There were no secondary growths and no hernia. There were fibroids of the uterus and cysts of the ovaries and tubes. (i. 2399.)

PAROTID.—This was a case of melanotic sarcoma of eight months' duration in a man, aged 55. (v. 2298.)

SYNOVIAL MEMBRANE.—The man, aged 22, from whom the primary growth had been removed in 1892, and recurrent growths in 1895 (see Report for that year, page 155), was again in the hospital on two occasions, and small recurrent growths were again removed. (iv. 373 and 2540.)

OPERATIONS ON THE TONGUE.

The classification of these operations is the same as that adopted last year.

Twenty-three operations were performed for the removal of **epithelioma** (including four cases of mere local removal); in twelve of these cases the glands were removed at the same time.

There were three deaths.

A carman, aged 62, from whom the anterior part of the tongue had been removed for epithelioma four months previously, was re-admitted with recurrence in the tongue and glands. **ALL THE REMAINING PART OF THE TONGUE** (the posterior half) was removed through the mouth; the glands were not touched as they were too extensively diseased to admit of complete removal. The patient was much relieved by the operation. His temperature remained normal until the fifteenth day after the operation, and by that time he was up and about the ward; his temperature then suddenly went up, and he died three days later. The post-mortem showed that the glands in the neck were breaking down and suppurating; there was œdema of the glottis, but no disease of the lungs. (ii. 443.)

A printer's labourer, aged 59. **ONE LATERAL HALF** of the tongue was removed through the mouth, and the anterior triangle of the neck thoroughly cleared out; the disease was very extensive both in tongue and glands. The wound in the neck communicated with that in the mouth. The patient became very delirious soon after the operation, then developed pneumonia and died on the sixth day. The post-mortem showed also secondary growths in the lungs. (v. 1533.)

A traveller, aged 60, was admitted with an epitheliomatous ulcer of four months' duration. There were no enlarged glands. One lateral half of the tongue was removed with scissors, but the neck was not opened. The after treatment consisted in dusting iodoform on to the wound, and after the third day, washing out of the mouth with Condy's fluid. The patient did well until the sixth day, when delirium set in. He became violently maniacal and died on the eleventh day. The temperature was never above 100° until within two days of death, when it rose to 104°. At the post-mortem, the heart was found to be very large and dilated. There was suppurative cholecystitis with gallstones, but there was no pneumonia. (v. 430.)

*Nineteen patients recovered.

* One patient was in the Hospital twice undergoing two operations.

A labourer, aged 65, was admitted with an epithelioma of the anterior part of the tongue of about three months' duration. He could not protrude the tongue freely, and the glands were enlarged on both sides of the neck. The **WHOLE TONGUE** was removed, and the mucous membrane sewn over the raw surface. The glands were not removed. After the operation the patient was very ill; for ten days the temperature was about 103°. It then fell rapidly, and the patient made a good recovery. The symptoms were attributed to the local condition in the mouth. There were no physical signs in the chest. The patient left the hospital on the twenty-second day after the operation. The operation on the glands was deferred until five weeks later, when he was re-admitted for their removal. He made a good recovery also from the second operation. (v. 2763 and 3250.)

After **EXCISION OF ONE LATERAL HALF** of the tongue through the mouth, together with **REMOVAL OF GLANDS**, nine patients recovered. In five of these recovery was uncomplicated. The patients were males aged 51, 46, 59, 49, 39. (i. 1558, 3135, iii. 3436, iv. 1148, v. 2295.)

A man, aged 38, after removal of the tongue, together with very free removal of cervical glands, was much collapsed, but soon made a good recovery, and left the hospital a fortnight later. (v. 1947.)

A prison warder, aged 49, with an epithelioma of five months' duration, underwent a similar large operation; convalescence was complicated by a good deal of delirium of a low type. (v. 1538.)

A brewer, aged 52, with an epithelioma of six weeks' duration, underwent removal of one-half of the tongue and submaxillary glands on one side. He did very well until eight days after the operation, when he suddenly coughed up four ounces of bright blood. This hæmoptysis continued at intervals for two days. No definite physical signs were found in the chest to account for it. The patient subsequently made a good recovery, and left the hospital quite well on the twenty-eighth day after the operation. (iii. 2872.)

A labourer, aged 55, underwent an extensive operation for the removal of an epithelioma of three months' duration, together with the glands; a mild attack of facial erysipelas followed, and the patient then made a good recovery. The patient had had a rigor and high temperature three days before the operation. (v. 2548.)

After **REMOVAL OF ONE LATERAL HALF OF THE TONGUE, BUT NOT THE GLANDS**, three men and one woman, aged 60, 58, 72 and 52, made good recoveries; the second of these cases was complicated by some recurrent hæmorrhage. (Male i. 1611, 1630, ii. 2585; Female i. 1963.)

After **REMOVAL OF THE ANTERIOR HALF TOGETHER WITH THE GLANDS**, two men, aged 51 and 66, made good recoveries. (i. 2310 and v. 1387.)

The four cases of local removal were men, aged 41, 56, 58 and 56; all did well. (ii. 2996, 3076, 3569, iii. 1929.)

Of removal of **papilloma** there were two cases, a man, aged 51 (v. 1195), and a woman, aged 60 (i. 2907*); both did well.

OPERATIONS ON BURSEÆ, FASCIÆ AND TENDONS.

There was no death or any serious complication after any of the fifty-six operations of this class.

A man, aged 45, was admitted with an extensive lacerated wound of the muscles and tendons of the forearm, as well as a fracture of the humerus and wound of the elbow joint. The wound was cleaned and the muscles and tendons sewn up. Two days later some cellulitis occurred, which was treated by iodine baths and injections of streptococcus antitoxin; under this combination of treatment the patient made a rapid and good recovery. (iv. 1107.)

A woman, aged 23, upon whom an operation was performed last year for a dislocated peroneus longus tendon, was re-admitted with fresh dislocation of the same tendon. A short portion of the tendon was resected, and the patient was discharged three weeks later with the foot still in plaster. (i. 1390.)

A very remarkable case was that of a male cook, aged 30, who was admitted with a large bursal swelling extending from Poupart's ligament to the lower third of the front of the thigh, and from the gracilis to the ilio tibial band. It lay below the extensor muscles. It had been first noticed seven months previously as a small lump over the great trochanter, and had evidently originated in the bursa over that bone. It was opened and drained and was found to contain 25,000 melon-seed bodies (about a pint), with a very little serous fluid. The patient made a good recovery. (i. 3612.*)

OPERATIONS ON THE NOSE.

There was no death or any complication after any of the fifteen operations of this class.

OPERATIONS ON THE LARYNX AND TRACHEA.

Of the fifty cases of tracheotomy for DIPHTHERIA, all but one were in the medical wards and do not appear in Table I. The fiftieth case was that of a girl, aged 20 months, admitted for hip disease, but showing signs of diphtheria soon afterwards. She was transferred to a medical ward and there died. (Described under **Joints**—TUBERCULOUS DISEASE, iv. 1239.)

For simple OEDEMA of the glottis, tracheotomy was performed upon a man, aged 48, who had been hoarse for twenty days; on the day of admission dyspnoea set in; the larynx was scarified, and on the second day tracheotomy was performed with a good result. (iv. 3236.)

Excision of half the larynx was performed once. A flaxworker, aged 66, was admitted with extreme dyspnoea, due to a malignant growth visible at the side of the epiglottis; for over two years he had been hoarse, and for six months he had been losing flesh. No enlarged glands were detected. After tracheotomy and plugging of the trachea with Hahn's cannula, the right half of the larynx with the tumour was removed and the wound partly closed. The patient died two days later of septic pneumonia. The growth was an oval mass of dense sarcoma an inch and a half in diameter, situated mainly between the thyroid cartilage and the mucous membrane of the larynx, and presenting a large shallow ulcer in the anterior wall of the pharynx. At the post-mortem, it was found that the whole of the primary growth had been removed, but there was slight infiltration of the cervical glands and a secondary nodule in the lung. Microscopically, the growth was reported to be sarcoma. (v. 1535.)

Thyrotomy.—A cabinet-maker, aged 32, was admitted for severe dyspnoea. Four years ago he had a large parenchymatous goitre which had existed thirteen years, when it was removed at a hospital in the country. Dyspnoea and dysphonia were the immediate result of the operation. The latter persisted, the former was at times so bad that eventually tracheotomy was performed and then thyrotomy and removal of the paralysed vocal cords. The wounds were then allowed to heal, but dyspnoea returned, and for this the patient was admitted. Tracheotomy was again performed, and subsequently all the old scar tissue within the larynx was freely removed, after the latter had been split open. The tracheotomy tube was worn for sixteen days after the operation, and then discontinued. The patient made an excellent recovery, and left the hospital six weeks later with a false glottis of fair size, and having had no return of dyspnoea. (v. 2922.)

OPERATIONS ON NERVES.

The four cases of primary and the five cases of secondary suture of nerves all did well, and presented no point worthy of special mention.

Resection and Transplantation.—A soldier, aged 43, had, eleven months before admission, been blown through a roof by an explosion in a powder factory. He was burnt, but not otherwise wounded. A few days before admission he had first noticed pain and numbness in the region supplied by the median nerve. A diffuse fibroma was partially removed from the median nerve near the bend of the elbow. Subsequently pain returned and he was re-admitted seven months later. A very tender and painful fusiform swelling could be felt in the course of the nerve just above the elbow. Three and a half inches of the nerve were found to be affected by diffuse fibroma and were resected; a corresponding length of fresh rabbit's spinal cord was introduced in its place. Primary union occurred; when the patient left the hospital, twenty-eight days later, there was no pain, but the sensation in the hand and forearm had not yet returned. (iv. 1128 and 3337.)

Division of both gustatory nerves was performed with much relief upon a man, aged 55, with very extensive epithelioma of the tongue of thirteen months' duration. (v. 1275.)

Exploratory operation.—A boy, aged 17, had dislocated both bones of the elbow eleven weeks before admission; the bones had been reduced and the arm kept in a splint for three weeks. Paralysis of the ulnar nerve had existed ever since. There was anaesthesia with wasting of the muscles and reaction of degeneration. There was some thickening of the nerve behind the elbow. The nerve was exposed, found to be thickened and inflamed, but not divided. Nothing more was done. The patient made a good recovery, but was not improved when he left the hospital three weeks later. (iv. 1828.)

OPERATIONS ON THE VASCULAR SYSTEM.

Ligature of arteries for aneurism.—A labourer, aged 52, and a potman, aged 34, underwent ligature of the FEMORAL in Hunter's canal for aneurism as large as an orange and a hen's egg respectively. In each case the aneurism had been first noticed three weeks before admission. In both cases the aneurism was cured, and the patients left the hospital on the sixtieth and twenty-eighth days after the operation. (iii. 1889; iv. 1691.)

The ANTERIOR TIBIAL was successfully tied in a man, aged 56, for an aneurism of the dorsalis pedis as large as a hazel nut. Two years before admission an earthenware pot had fallen upon his foot, and fifteen months later the aneurism had been first noticed. (iv. 1893.)

Extirpation of aneurism of common carotid.—A ship's steward, aged 49, was admitted on account of a swelling in his neck which had been growing for six years, at first slowly, but in the last four months rather rapidly. It had caused little or no trouble. Just below the angle of the jaw on the right side was a deep-seated, rather fixed, well-defined, hard, non-pulsating swelling as large as a small orange. It was cut down upon, and when opened found to consist almost entirely of old and recent blood clot. Smart hæmorrhage occurred. Its aneurismal nature being recognised, ligatures were placed upon the common external and internal carotid arteries, the vagus and internal jugular vein dissected off and the whole mass extirpated. The aneurism had originated in the upper part of the common carotid. Subsequent examination showed that in places the wall of the aneurism was very thin and on the point of bursting. The patient made a good recovery, and left the hospital on the forty-sixth day after the operation. When seen again, several months later, he was in excellent health. (i. 3579.*)

Ligature of internal jugular vein.—The three cases have been fully described under TREPHINING THE LATERAL SINUS. Male (ii. 2769, 3099, and iv. 1753).

Ligature or excision of varicose veins was performed thirty-six times without any serious complication.

Removal of venous cyst of the forearm. A girl, aged 12, was admitted with a venous cyst as large as a walnut just below the front of the bend of the elbow. It was removed and found to be a well-defined cyst connected with one of the deep veins of the forearm. It had existed four years but had caused no trouble. The patient made a good recovery. (v. 1040.)

OPERATIONS ON THE GENITO-URINARY ORGANS.

Nephrotomy was performed three times for pyonephrosis, twice for hydronephrosis, and four times as an exploratory operation for renal pain, hæmaturia, sarcoma and carcinoma of the kidney respectively.

PYONEPHROSIS—A woman, aged 33, recovered after nephrotomy for pyonephrosis of three years' duration; no calculi were found, and the patient left the hospital forty-seven days later with the wound healed. (ii. 104.)

A single woman, aged 42, was admitted with a large pyonephrosis of seven years' duration. It was drained from the loin, several pints of seropurulent fluid being evacuated. Recovery was slow and complicated by some dementia, but the patient eventually left the hospital thirty-two days after the operation with the wound healed. (v. 1941.)

A porter, aged 39, was admitted for pyuria and pain and swelling in the region of the right kidney. Symptoms had existed about six months. Much pus was evacuated from the kidney through a lumbar incision, but no cause was found. The wound gradually closed, and the patient left the hospital on the sixty-sixth day after the operation. When he was seen again, six weeks later, a fistulous opening in the loin was present. (i. 3724.*)

HYDRONEPHROSIS.—A woman, aged 50, was admitted with a hydronephrosis of five years' duration, but no urinary symptoms. It was drained through the loin, and the patient left the hospital with a sinus discharging slightly. She was subsequently re-admitted and the kidney removed. (iii. 157 and 903.)

A milliner, aged 24, was admitted with a hydronephrosis which had existed six years, and was attributed to an injury to the loin. The patient suffered much pain and had a good deal of pyuria. The cyst was drained through the loin and about half a pint of turbid urine let out. As the kidney substance had not been wholly destroyed, nephrectomy was not performed. After the operation the patient vomited frequently, passed very little urine, then became very restless, and finally died on the seventeenth day after the operation. The temperature was markedly subnormal. At the post-mortem, it was found that the opposite kidney was congenitally rudimentary, measuring only one and one-third inch in length, and being functionally quite useless. (iii. 1227.)

HÆMATURIA.—A man, aged 30, had had for three months hæmaturia and pyuria. No disease of the bladder was discovered, and an exploratory lumbar nephrotomy showed the right kidney to be perfectly healthy. The wound healed quickly. (iii. 149.)

RENAL PAIN.—A gasfitter, aged 34, had suffered for five years from dull aching pains in the back and loins, worse on the right side. He had also frequent attacks of more severe pain, during which there was increased frequency of micturition. There was some tenderness over the kidney, but no tumour. The right kidney was exposed through a lumbar incision, and the pelvis opened and examined. No calculus or any other disease was discovered. The wound healed and the patient left the hospital six weeks after the operation, relieved from his pain. (iii. 3361.*)

SARCOMA.—A bricklayer, aged 54, was admitted with hæmaturia and renal pain. He had recently had an attack of orchitis. The enlarged right kidney was explored through the loin and found to be malignant, but the patient refused further treatment. He was re-admitted later. See below, sub Nephrectomy. (i. 3039.*)

CARCINOMA.—A woman, aged 47, who had had pains in the abdomen and emaciation for nine months, and hæmaturia six months, was admitted slightly jaundiced and with an enlarged and tender right kidney. An exploratory nephrotomy evacuated several ounces of soft broken-down white material, looking like inspissated tuberculous pus. The kidney was drained. The patient gradually sank and died eight days later. The post-mortem showed a carcinomatous tumour in the upper part of the right kidney and extending into the liver. The lumbar glands were much infiltrated. (i. 2822.*)

Nephrectomy (abdominal) was performed three times for pyonephrosis, hydronephrosis and sarcoma respectively.

PYONEPHROSIS.—A woman, aged 39, had had for fifteen years intermittent pain in the side; in the last six weeks it had been much worse and accompanied by frequent micturition and turbidity of the urine. Two weeks before admission a swelling had been first noticed. The abdomen was opened, the retro-peritoneum and capsule of the kidney opened, and the kidney shelled out. At this stage the kidney burst and much pus escaped into the peritoneal cavity. The pedicle was tied, the kidney removed, the peritoneal cavity washed out and the wound drained from the loin. After the operation about ten ounces of blood drained away through the tube; the patient gradually sank and died twenty-two hours after the operation. At the post-mortem, eleven ounces of blood were found in the peritoneal cavity and five within the capsule; the tumour was a simple pyonephrosis. (ii. 1897.)

HYDRONEPHROSIS.—A female infant, aged 22 months, was admitted with a tense elastic rounded swelling as large as an orange, situated in the left loin, but freely moveable over most of the left half of the abdomen. The urine was of sp. gr. 1009 and excessive in quantity. There were no urinary symptoms, and the child appeared to be in good health. Abdominal nephrectomy was performed, the kidney consisting of one large cyst with apparently very little renal tissue. The right loin was examined at the time of operation, and as no tumour was felt there, it was concluded that the kidney there was normal. With the exception of one and a half ounces passed about four hours after the operation, no urine whatever was secreted. The child gradually became comatose and died on the twelfth day after the operation with symptoms of uræmia. The post-mortem showed extreme congenital atrophy of the right kidney, which was functionally quite useless. The kidney removed was a simple hydronephrosis. (v. 2559.)

SARCOMA.—A hawker, aged 42, had for several months been losing flesh, for five months he had had slight hæmaturia; two months before admission he had first noticed pain in the right loin. Three weeks later he passed a pint of blood, and for this he was admitted to a medical ward, whence he was transferred three weeks after admission. He was anæmic and wasted. In the right renal region was an oval, slightly moveable mass as large as a foetal head. Abdominal nephrectomy was performed, and the kidney removed without much difficulty, although it was very soft and broke up during removal. The wound was drained through the loin and the patient made a good recovery from the operation, leaving the hospital forty-five days afterwards. The wound was healed and there were no signs of recurrence. The tumour was a Sarcoma. (ii. 2998.)

Nephrectomy (lumbar) was performed four times for pyonephrosis, hydronephrosis (two cases) and sarcoma.

PYONEPHROSIS.—A woman, aged 40, had had for eleven months pain in both loins, but worse in the right. The abdomen was opened in the semi-lumbar line, and both kidneys felt to be enlarged. A lumbar incision was then

made in the right loin and pus and calculi let out; as all the stones could not be taken away, the right kidney was removed through the lumbar incision. The patient never rallied and died next day. The post-mortem showed that the left kidney was healthy, the right ureter contained pus, and the liver had commencing amyloid disease. (iii. 40.)

HYDRONEPHROSIS.—A clerk, aged 21, had had for five months attacks of renal pain, and for five days a swelling in the loin, but never any urinary symptoms. The patient had a high temperature and was ill. Lumbar nephrectomy showed a simple hydronephrosis; the operation was followed by some suppuration, a sinus remained open for many weeks, but had healed when the patient left the hospital one hundred and six days after the operation. (iv. 1166.)

The woman, aged 50, to whom reference has been made under nephrotomy, was re-admitted three months later with fresh swelling. A large hydronephrosis was removed through the loin. The renal tissue had practically all disappeared; there was no stone. She never had a bad symptom after the operation, and left the hospital seventeen days later with the wound healed. (iii. 903.)

SARCOMA.—The man, aged 54, to whom reference has been made under nephrotomy, was re-admitted six months later. During this time he continued to have much pain, and had been unable to work. At his urgent request a second operation was performed, and the kidney, which was enlarged to three times its normal size, was removed through a lumbar incision. The operation was difficult on account of the fixity of the tumour. The patient died of shock eight hours later. The post-mortem showed numerous secondary growths in various parts of the body. (i. 1627.)

Nephrolithotomy was performed five times, with no deaths.

A woman, aged 23, had had for twelve months a dull pain in the region of the right kidney. There had been no hæmaturia. The kidney was easily felt and was somewhat tender and somewhat unduly moveable. An oxalate stone as large as a cherry was removed through a lumbar incision, and the kidney stitched to the abdominal wall. The patient left the hospital twenty-eight days later, quite well, and with the wound healed. (iii. 1170.)

A woman, aged 28, who had been in the hospital nine years previously with pyonephrosis, and who had had a renal fistula ever since, was re-admitted. A stone as large as a walnut was removed through a lumbar incision, and the patient made a good recovery, leaving the hospital forty-six days later with the wound almost healed. (v. 1432.)

A woman, aged 29, had had for eleven years slight pain in the right side of the abdomen; in the last five years the pain had been much worse, and a swelling in the region of the right kidney had been noticed for the same time. The urine contained pus, but no blood. Through a lumbar incision a large branched stone was removed; it nearly filled the pelvis of the kidney. The kidney was considerably enlarged and contained a little pus. Recovery was complicated during the first three weeks by a sharp attack of pneumonia. The patient then made a good recovery, and left the hospital on the seventy-sixth day after the operation with the wound healed. (v. 2314.)

A delicate-looking man, aged 20, had suffered for years with pain in the loin, much worse in the last six months, and for the last fourteen weeks accompanied by rigors; he had never passed gravel or blood. Through a lumbar incision much pus was let out of the kidney, and three stones, the largest as big as a walnut, were removed. The kidney was drained, and the patient made a slow, but good recovery, and left the hospital seventy-five days later with the wound healed.

A courier, aged 36, had had for sixteen months hæmaturia and attacks of renal pain. An oxalate stone as large as a marble was removed through a lumbar incision, and the patient made a good recovery, leaving the hospital twenty-eight days later with the wound healed. (v. 1940.)

Nephrorrhaphy.—This operation was performed six times; all the patients were women. A cook, aged 32, had had for six years pain in the region of the right kidney. Nothing abnormal was found in the urine. The kidney could be felt, but did not seem enlarged or unduly moveable. An exploratory lumbar operation was performed, the kidney exposed and punctured with a needle, the pelvis opened and a catheter passed down the ureter. No stone or any other abnormality could be discovered. The wound was drained. On the sixth day after the operation there was profuse hæmaturia which lasted many days. An attack of cystitis followed. On the thirty-fifth day after the operation, when the wound was nearly healed, the temperature suddenly rose to 107° with a rigor. Nothing, however, was found to account for this, and the temperature subsided in five days. When the patient left the hospital on the fifty-first day after the operation the wound was healed and the urinary symptoms had subsided. (iii. 2320.)

A dressmaker, aged 51, had had for three years attacks of renal pain. A lumbar incision showed the right kidney to be moveable, but otherwise normal; it was stitched to the abdominal wall. The wound did not heal, and the patient was discharged on the fortieth day after the operation with a sinus still open. (iii. 2468.)

The other patients were women, aged 32, 39, 27 and 24; all made good recoveries, but in the last case the kidney was as freely moveable after the operation as before. (iii. 1556, 2282, v. 759, iv. 198.)

Lithotripsy was performed seven times without a death.

A man, aged 60, had had symptoms of stone for five years. Two oxalate stones coated with phosphates were crushed, and the patient made a good recovery. (i. 2266.)

A man, aged 35, had had symptoms of stone for two years; the stone was felt with a sound and seen with a cystoscope. Lithotripsy was attempted, but no stone could be found. The patient afterwards lost most of his symptoms, and left the hospital a fortnight after the operation. (iii. 3081.)

A man, aged 19, had, for the last twelve years, occasionally passed small stones per urethram. In the last three years the symptoms of stone had been more severe. Some fragments were, however, left behind, and one of these having become impacted in the prostatic urethra, perineal median lithotripsy was performed, and the fragment removed together with another from the bladder. The patient made a good recovery, and left the hospital thirty-seven days after the second operation, quite well, and with the wound healed. (ii. 2262.)

A man, aged 23, had been operated upon for radical cure of hernia sixteen months previously at another hospital; a pouch of bladder had been opened and sutured with silk. This was followed by pyuria and symptoms of stone, for which the patient was admitted. Lithotripsy was performed, two stones, one half an inch in diameter, being crushed. The patient made a good recovery. (v. 3178.)

The other three patients were males, aged 39, 55 and 9, all of whom made good recoveries. (i. 512, ii. 1501, 3636.)

The first of these was re-admitted three months later and underwent median perineal lithotomy.

Lithotomy.—**PERINEAL.**—Performed twice; one case was that of the patient just mentioned, he had had symptoms of stone for three years. Lithotripsy had already been performed twice. Median lithotomy was performed,

as it was thought that one stone at least was present in a prostatic pouch. At the operation ten stones were removed. The patient made a good recovery and left the hospital five weeks after the operation. (i. 1779.)

The other case has been described under lithotrixy. (ii. 2262.)

Supra-pubic.—A man, aged 49, upon whom supra-pubic lithotomy had already been performed twice, four years and ten years previously, was re-admitted with fresh symptoms of six weeks' duration. The same operation was performed a third time, a uric acid stone one inch in diameter being removed. The wound was drained, the tube being removed next day. A catheter was kept in the urethra. The wound healed in ten days, and the patient left the hospital on the twenty-sixth day after the operation, quite well. (ii. 223.)

Another case is described under supra-pubic cystotomy for enlarged prostate. (v. 2290.)

Cystotomy.—**SUPRA-PUBIC.**—This operation was performed nine times, with one death; twice for carcinoma, three times for villous papilloma, once for foreign body, once for enlarged prostate, and twice for tuberculous disease. A gas worker, aged 53, had had for eighteen months intermittent hæmaturia, frequency of micturition, and occasional slight pain on micturition. Recently his pain and distress had become much worse. The prostate was felt to be hard and nodular. The bladder was opened and a large malignant ulcer was found near the trigone. A permanent fistula was established, and the patient left the hospital seven weeks later, much relieved. (ii. 2919*.)

A quarryman, aged 58, had had for nine months difficulty in micturition and occasional retention. When admitted there was much cystitis, and the prostate was much enlarged and hard, especially on the left side. There was much pus in the urine. Supra-pubic cystotomy was performed, and the bladder drained with much relief. Six weeks later, the temperature, which had been normal, rose rapidly, and the patient died of pneumonia on the fifty-second day after the operation. The post-mortem showed extensive carcinoma of the prostate, with a good deal of suppuration around the tumour and the base of the bladder. (ii. 3215*.)

A schoolmaster, aged 31, was admitted, much blanched, from ten years intermittent hæmaturia. With the cystoscope a villous tumour was seen. Numerous villous growths on different parts of the bladder were removed, and the patient made a good recovery, leaving the hospital with the wound healed. (v. 519.)

A bookbinder, aged 43, who had had hæmaturia for seven years, and had had villous tumours removed one year and four years previously, was re-admitted. More growth was removed, the forceps being left on the stump of the growth for a week to prevent hæmorrhage. The patient made a good recovery, but was admitted with recurrence in the following year. (i. 445.)

A female cook, aged 30, had had for four or five years dull pain in the right side of the abdomen, worse in the last three months. There was also a history of hæmaturia on several occasions. The cystoscope showed a small villous tumour near the right ureter. The growth was removed by scraping. The wound was partially sewn up and drained for ten days. The patient made a good recovery, and left the hospital on the twenty-first day after the operation. There was then no hæmaturia or pyuria. (iii. 1510.)

A warehouseman, aged 70, was admitted for cystitis and a history of having broken the end of a catheter into the bladder a week previously. For many years he had been using a catheter for enlargement of the prostate. After attempts to find the catheter with a lithotrite had failed, the bladder was opened, and a piece of catheter, rather more than one inch long, was removed. A drainage tube was kept in for seven days. The patient made an uninterrupted recovery, and left the hospital on the twenty-sixth day after the operation with the wound healed. (iii. 2803.)

A shopkeeper, aged 64, was admitted for hæmaturia. For eight years he had had prostatic symptoms (pain, frequency of micturition, hæmaturia, and attacks of retention). He had been using a catheter constantly during this time. Four days before admission hæmaturia occurred, and very little urine was passed. He was relieved by catheterisation. On the fourth day after admission, the hæmaturia continuing, the bladder was opened, and two calculi were removed. The middle lobe of the prostate, which was much enlarged and pedunculated, was also tied and removed. The bladder was drained for nine days. The patient made an excellent recovery, and left the hospital on the thirty-second day after the operation. The wound was then healed, but it broke down a few days later. In the next three months it healed and re-opened more than once, but the patient's general health remained good, and the local relief afforded by the operation was very great. (v. 2290.)

A carpenter, aged 40, was admitted with tuberculous disease of the bladder. He had been quite well until three weeks before admission, when painful and frequent micturition set in, followed a fortnight later by profuse hæmaturia, which persisted. On admission the urine contained much blood and numerous tubercle bacilli. The right testis and right side of the prostate were enlarged and hard. Seven weeks after admission the bladder was opened above the pubes, and the tuberculous disease found to be so extensive that no scraping was done; the bladder was simply drained. The wound became infected with tubercle and never healed. He was treated with iodoform injections, and was eventually discharged nine months after admission with the disease still progressing. The temperature was rarely above normal. (v. 3737*.)

A boy, aged 15, had been quite well until eleven months before admission, when he first noticed painless hæmaturia, followed by frequency of micturition. Recently more severe hæmaturia and pain set in. On admission he had a good deal of cystitis, and bright blood was passed at the end of micturition. Three weeks after admission the bladder was opened; tuberculous disease was found chiefly in the posterior wall, and was scraped. The wound was partially sewn up and drained, but it never healed. The patient gradually lost ground, and was eventually discharged to an infirmary six months after the operation. (iv. 3083.)

PERINEAL.—A porter, aged 44, one week before admission had suffered from retention of urine. This he had tried to relieve by the passage of the stem of an ordinary churchwarden tobacco pipe. He was successful in the attempt, but as he happened to cough at the critical moment, a portion of the pipe broke off. Median perineal cystotomy was performed and the foreign body felt lying across the bladder. It was broken in two, and the halves extracted with some difficulty. The piece of pipe stem was found to be four and a half inches long. (ii. 3106.)

Supra-pubic puncture was performed for stricture upon two patients, both aged 41.

Prostatectomy.—The only case has already been described under supra-pubic cystotomy. (v. 2290.)

Castration.—For EPITHELIOMA OF SCROTUM. This case is described under removal of tumours. (i. 381.)

For GANGRENE.—A testis that sloughed after an open operation for varicocele was removed from a man, aged 40. (iii. 798.)

For HÆMATOCELE.—A case of a man, aged 20, with a thick walled hæmatocele of two years' duration. (i. 576.)

For RETAINED TESTIS.—Performed twice upon patients, both aged 18. (iv. 1511, 1690.)

For TUBERCULOUS TESTIS. Performed five times upon patients aged 35, 2, 32, 21 and 50. (i. 1882, iii. 1810, 1881, iv. 1333, v. 3339.)

Erasion of Tuberculous testis. Performed twice upon patients, aged 25 and 27. (i. 1469, 1846.)

Transplantation of retained testis. Performed seven times, in some cases with some success. (i. 595, 1868, 2321, ii. 765, 2939, v. 3588, 1459.) In one case the operation was followed by considerable temporary mental disturbance. (ii. 2939.)

Ligature of varicocele. Performed nineteen times by the open, and nineteen times by the subcutaneous method; the only serious complication was sloughing of the testis, which occurred after an open operation on a man aged 40. (iii. 798.)

Excision of the sac of a hydrocele was performed seventeen times with uniform success.

Excision of the sac of a hæmatocele was performed three times; in one of these cases the hæmatocele had existed five years and was very large, measuring eight inches by five. The man's age was 39. (ii. 330.)

Internal urethrotomy was performed fourteen times; in three cases the operation was followed by considerable hæmaturia, lasting in one case for eighteen days (v. 1042, 3265, 3477). In six other cases the operation was followed by rigors (iii. 73, 2207, v. 216, 419, 3063, 3712*). In one other case there were no rigors, but the temperature had begun to rise before the patient left the hospital (v. 2649). In the other four cases there were no complications (ii. 2746, v. 429, 803, 3542). In no case was there any death or any serious complication.

External urethrotomy was performed three times for rupture of the urethra, and eleven times for stricture. A man, aged 42, fell eighteen inches astride a wheel and began to bleed from the urethra; no catheter could be passed. About an hour after the accident the perineum was opened, a rent three-quarters of an inch long was found in the urethra and sewn up at once with fine silk; the wound was drained for twenty-four hours, and a catheter left in the bladder for six days, then passed intermittently. The patient made a perfect recovery, primary union occurring, and the patient leaving the hospital on the fifty-sixth day, able to pass a full-sized catheter without any trouble. (ii. 3456*.)

A railway porter, aged 33, had fallen astride a buffer, and was admitted five hours after the accident. An operation was performed immediately, and the urethra found torn completely across. Although the patient had tried to pass water, there was no extravasation. The urethra was sewn up with fine silk, and the external wound sewn up, except posteriorly where it was drained. A catheter was kept in the bladder for five weeks, during which time a little urine also came through the wound. The latter then healed completely, and the patient was quite well when he left the hospital fifty-four days after admission. (iii. 2949.)

The third case was that of a boy, aged 8, admitted nineteen hours after having been run over. There was some extravasation of urine. He made a slow but good recovery. (v. 978.)

A boy, aged 11, was admitted with extravasation of urine. One month before admission he passed some blood with his urine, and since that time had had painful and frequent micturition. On the day before admission, a swelling was first noticed in the perineum. There was no history of injury, and no stone could be detected by sounding. An incision was made into the perineum and urinous pus let out. The urethra and external wound were both sewn up. A tight traumatic stricture followed, and for this a Wheelhouse's operation was performed six weeks later. The boy left the hospital three months after

admission with a small perineal fistula still open, but in other respects quite well. The cause of the original trouble was never clearly ascertained. (iii. 1262.)

The other nine cases were ordinary cases of stricture; there were no complications. In nearly all these cases Wheelhouse's was the operation performed; there was one case of Cock's operation. (v. 1851.)

Removal of urethral caruncle. These eleven cases were all in the gynæcological ward and consequently do not appear in Table I. (see Medical Report).

Vaginal hysterectomy. The same remark applies to the six cases of vaginal hysterectomy. They were all cases of sarcoma or carcinoma of the uterus.

OPERATIONS ON THE RECTUM AND ANUS.

Among ninety-three operations of this class, there was one death after excision of the rectum (see below.) The only other complication was secondary hæmorrhage, which occurred in the case of a man, aged 23, on the tenth day after an operation for ligature of piles; the hæmorrhage was easily controlled by packing. (ii. 2265.)

Excision of the rectum was performed five times, with the one death above mentioned. The patient was a gamekeeper, aged 33, who had had diarrhoea, passage of blood and emaciation for three months. An extensive carcinomatous growth was found on the posterior wall of the rectum extending beyond the reach of the finger. Excision of the rectum was performed, the coccyx being also taken away, but the whole of the growth could not be removed. The operation was very extensive. On the fourth day afterwards double parotitis occurred, and the patient gradually sank and died on the thirteenth day after the operation. There was no post-mortem. (ii. 3322.)

A woman, aged 36, with a history of seven weeks symptoms, was admitted with a carcinomatous growth as large as a walnut on the anterior wall of the rectum, just within the anus. It was removed freely with part of the recto-vaginal septum; the sphincter ani was not removed. The patient made a good recovery, and left the hospital on the forty-first day after the operation. (i. 926.)

A miner, aged 40, had had no rectal symptoms until two weeks before admission. One brother had died of cancer of the rectum, and a sister had recently undergone colotomy at another hospital for the same disease, complicated with multiple polypi of the rectum. On admission he was found to have numerous small polypi scattered all over the rectum as high as the finger could reach. On the anterior wall was a fairly movable carcinomatous nodule, about an inch and a half in diameter. It was excised together with the lower part of the rectum, and the patient made a good recovery, leaving the hospital thirty-five days after the operation. (i. 636.)

The same patient was re-admitted with recurrence seven months later, and a further excision was performed with good result. (i. 3314.)

The fifth case was that of a woman, aged 54, who had had symptoms of rectal carcinoma for about three and a half months. An ulcer involving the lowest inch and a half of the posterior wall of the rectum was freely removed. The patient did well for some weeks, then developed trouble in her lungs with high temperatures, and left the hospital at her own wish on the eighty-second day after the operation. (ii. 265.)

Linear proctotomy was performed upon women, aged 35 and 42, for simple fibrous stricture of the rectum. (ii. 1533, 2315.)

MISCELLANEOUS OPERATIONS.

Excision of tuberculous glands was performed forty-seven times, with one death.

A printer, aged 20, was admitted with tuberculous glands in the neck of eighteen months' duration; they were removed without any difficulty. The patient was recovering from the anæsthetic, and was vomiting, when suddenly the pupils dilated and the heart stopped. All efforts to restore him failed. The post-mortem showed a small, somewhat flabby heart, but there was no disease of any other viscus, and no tubercle in any organs except the glands of the neck. (i. 1861.)

Erasion of tuberculous glands was performed seventeen times without a death or any other complication.

Erasion or excision of lupus was performed twenty-three times without any complication.

Cesophagotomy was performed twice. A warehouseman, aged 52, had suffered for three months from loss of flesh, and for two months from dysphagia; for one month he had been able to swallow only liquids. There appeared to be considerable pouching of the cesophagus, as the patient after drinking quickly would bring back much more than he had drunk. At times large bougies could be passed, at other times nothing would go down. Cesophagotomy was performed on the left side; it was expected that a definite pouch would be found, but none could be found. A catheter was passed through the wound into the stomach and tied in; afterwards the catheter was passed from the mouth. The patient made a slow recovery, and left the hospital two and a half months after the operation, able to swallow soft food, but with a fistulous opening in the neck. (v. 388.)

A labourer, aged 47, was admitted with a malignant stricture of ten months' duration. For four months he had been able to swallow only liquids. His general condition was fairly good, but he could swallow nothing. Nothing could be passed through the stricture, bougies stopping eight and a half inches from the teeth. Cesophagotomy was performed on the left side of the neck, but it was found that the lower edge of the growth could not be reached. The cesophagus was therefore opened above the stricture and a catheter passed through it with much difficulty. The patient died of shock eighteen hours later. The post-mortem showed that two inches of the cesophagus were infiltrated with epithelioma. (v. 597.)

Excision of branchial fistula.—A boy, aged 6, was admitted with a minute fistula just opposite the cricoid, discharging clear fluid. A probe passed upwards for two inches. The whole fistulous track was dissected out, and the boy made a good recovery. (iii. 2824.)

Excision of cerebral meningocele.

A female child, aged 3 months, was admitted with an occipital meningocele. At birth it had been as large as a walnut, and it had grown to the size of an orange; it was situated exactly in the centre of the squamous part of the occipital bone. The pedicle was about an inch in diameter. The skin was reflected, the pedicle tied and the tumour removed. Within the main sac was another which was treated in the same way. The child developed retraction of the head and slight convulsions, and died comatose two days after the operation. At the post-mortem, it was found that there had been considerable distension of the ventricles and flattening of the brain. (i. 1080.)

Excision of spinal meningocele.

A female child, aged 6 weeks, was admitted with a lumbar spina bifida about two inches in diameter. Part of it was excised, and the remainder closed with sutures. The child made a good recovery. (iii. 509.)

Removal of hydatid.

A girl, aged 17, had had for three months a swelling in thigh; it had increased steadily in size and caused a good deal of pain. In the muscles at the inner and lower part of the thigh was a firm nodular deep-seated lump as large as a hen's egg. The diagnosis was uncertain. The tumour was thought to be either a gumma or a sarcoma. When cut into it was found to be a hydatid with numerous daughter cysts. It was removed, and the patient made a good recovery. (ii. 495.)

Removal of foreign bodies.—Five cases of needles in the hand (Female i. 1752, ii. 1464, iii. 1727, v. 2436; Male iv. 2346), two of bullets in the hand (Male iii. 3434, v. 2874), a pin in the pharynx (Female i. 2193) and a half-penny in the pharynx (Male iv. 3554). In many of these cases the Röntgen rays were of much assistance in the diagnosis.

OPERATIONS FOR HERNIA.

Herniotomy for strangulation was performed twenty-four times, with ten deaths.

Femoral hernia.—Seven deaths, five recoveries.

FATAL CASES.—All women. A woman, aged 78, was admitted collapsed, with a history of six days strangulation. Herniotomy was performed at once, but the patient gradually sank and died four days later. The post-mortem showed no peritonitis; the strangulation was three feet above the ileo caecal valve. The kidneys showed old tuberculosis and much atrophy, and seemed to have been the main cause of death. (i. 529.)

A woman, aged 79, had had for four years a small femoral hernia and for three days strangulation. Herniotomy showed strangulation of an inch and a half of bowel; the patient sank and died on the second day. The post-mortem showed no peritonitis or perforation, but there was some chronic interstitial nephritis. (ii. 1318.)

A woman, aged 64, had had for twelve years a hernia, for seven days constipation, and for five days pain and vomiting. On admission there was collapse, faecal vomiting and a small hernia. Herniotomy showed a small perforation of the intestine; the bowel was opened and sewn to the skin, and the patient died next day. The post-mortem showed extravasation of faeces into the peritoneal cavity. (iv. 318.)

A woman, aged 65, had had for eight days constipation, for six days vomiting, latterly faecal. She died twelve hours after the herniotomy. The post-mortem showed strangulation eleven feet above the ileo caecal valve. The intestine for several feet below this was on the verge of gangrene; there was no perforation. (iv. 779.)

A woman, aged 74, had had for three days pain, vomiting and constipation. When admitted she was very ill, and her breathing was rapid. At the herniotomy the gut was found to be gangrenous and gave way. A glass tube was inserted. Afterwards the temperature never rose above normal, and the abdominal distension disappeared, but the patient died of exhaustion on the third day. (iv. 1534.)

A woman, aged 40, was admitted with strangulation of three days' duration. On admission the general condition was fairly good and there was no collapse. The sac was opened, the stricture divided, and the gut found to be gangrenous. Ten inches were resected and the ends joined by Murphy's button. The patient died next day. Examination after death showed that the two halves of the button had not been accurately approximated and that mucous membrane protruded between them. (v. 931.)

A woman, aged 78, was admitted with strangulation of forty-eight hours' duration. Herniotomy was followed by death on the second day. There was no post-mortem. (v. 2756.)

RECOVERIES.—Four women and one man.

A woman, aged 59, with strangulation of one day's duration. (i. 1817.)

A woman, aged 82, had had for three years hernia never completely reduced. Pain and vomiting set in a few hours before admission. The hernia was large. On opening the sac, the hernia, which was adherent to it, was wounded. The wound, about $\frac{1}{4}$ -inch long, was sewn up with Lembert's sutures and returned into the abdominal cavity. The patient made an excellent recovery, and left the hospital on the twenty-fifth day after the operation. (iii. 592.)

A woman, aged 45, with hernia of six years' duration and strangulation for one day made a good recovery. (iii. 2575.)

A woman, aged 39, with incomplete strangulation for three days made a good recovery. (iv. 167.)

A man, aged 54, with eight hours strangulation, made a good recovery. (ii. 139.)

Inguinal hernia.—Six cases ; all men ; all recovered.

A man, aged 25, with strangulation of a few hours. (ii. 1832.)

A milkman, aged 30, with strangulation of ten hours, not very acute ; the hernia was of the interstitial variety, mainly between the external oblique and the deep fascia. (iii. 2772.)

A man, aged 38, with twelve hours strangulation of a congenital hernia. (iv. 2449.)

A man, aged 75, with strangulation of a few hours. (iv. 3520.*)

A man, aged 49, with strangulation of a few hours ; recovery was complicated by an attack of facial erysipelas, beginning nine days after the operation ; the wound healed by first intention and showed no signs of inflammation. (v. 435.)

A painter, aged 24, who had suffered for about three months with albuminuria and dropsy, was admitted with a small tense irreducible inguinal hernia, which appeared to be strangulated although there was no vomiting. After several unsuccessful attempts at reduction with and without a hot bath, it was finally reduced with some difficulty under an anæsthetic. Vomiting began soon afterwards, and on the following day the patient had a convulsion, apparently uræmic. Vomiting continued on and off for the next four days, and was thought to be due to the renal disease. On the fifth day after admission the patient was so much worse that the abdomen was opened and a piece of intestine found strangulated in the inguinal canal ; an ordinary herniotomy incision was then made, the gut freed and the rings sewn up. The patient made an excellent recovery, and left the hospital on the thirty-first day after the operation, quite well. It was never quite clear whether the hernia had been reduced en masse or whether a fresh strangulation had taken place. (v. 1751.)

Umbilical hernia.—Three deaths ; one recovery.

FATAL CASES.—A man, aged 57, had had for many years a hernia that was never completely reducible ; he had had several attacks of obstruction. Four days before admission the hernia had become larger and more painful and vomiting set in. On admission the patient was very ill, with faecal vomiting and a large tense umbilical hernia. He was enormously stout. Herniotomy

was performed at once and the vomiting ceased, but the patient soon became very blue, respiration became more and more laboured, and he died two days later. Post-mortem : there was no peritonitis, but the lungs were very œdematous and the heart large and fatty. (i. 2349.)

A male infant, aged 1 day, was admitted with a true congenital strangulated umbilical hernia ; it was two inches in diameter and beginning to slough. Herniotomy was performed and the gut opened, but the child died a few hours later. (iii. 366.)

A woman, aged 53, had had four days constipation, three days vomiting, and four hours faecal vomiting. The abdomen was not much distended ; there was some collapse. Herniotomy was performed at once and much omentum cut away ; a small knuckle of intestine in fair condition was reduced. The sac was removed and the ring closed. The operation lasted two hours. Afterwards the patient became very delirious, diarrhoea set in, and she gradually sank and died on the fifth day. The post-mortem showed no peritonitis or any other definite cause of death. (ii. 2052.)

RECOVERY.—A woman, aged 45, was admitted with strangulation of a few hours. She had had a hernia for two years, and had twice undergone operations for strangulation at other hospitals. The hernia was as large as an orange. Herniotomy and radical cure were followed by a good recovery. (ii. 1997.)

Ventral hernia.

A woman, aged 62, had undergone abdominal section for some abdominal tumour ten years previously. She was admitted to the hospital for glaucoma, and while under treatment for this, the hernia became strangulated. Herniotomy was performed a few hours later and she made a good recovery. (v. 135.)

A woman, aged 36, with strangulation of a few hours, also made a good recovery. (i. 822.)

Inguinal hernia reduced en masse.

A man, aged 67, had had a small hernia for seven or eight years. Thirteen hours before admission it came down, and soon afterwards pain and vomiting set in ; attempts at reduction were made outside the hospital and failed. He was admitted in good condition and had much pain and little vomiting. No hernia could be felt in the inguinal canal, but there was an indistinct swelling in the abdomen above it. Herniotomy was performed at once and a small knuckle of intestine found strangulated at the neck of the sac ; apparently it had been pushed back through the canal. A radical cure was done, and the patient made a good recovery. (i. 1198.)

Another case of doubtful reduction en masse has been described under herniotomy for inguinal hernia. (v. 1751.)

Radical cure of reducible hernia was performed one hundred and twelve times upon ninety-four male and eighteen female patients. One patient died.

A labourer, who had been a heavy drinker, was admitted with a small reducible hernia and a varicocele. Bassini's operation was performed and the varicocele tied at the same time. On the second day after the operation the temperature began to rise rapidly, the patient developed pneumonia, first in one lung, then in the other, and died on the tenth day after the operation. At the post-mortem, part of one lung was found to be in a state of gangrene. The wound was practically healed, all the deep part being soundly healed. There was no peritonitis. (v. 1373.)

The complications in the cases that recovered were pneumonia in a boy, aged 12 (v. 7) and in a girl, also aged 12 (v. 858), thrombosis of the femoral and saphenous veins respectively in men, aged 19 and 23 (ii. 1679 and v. 3016), scarlatina on the second day after the operation in a boy, aged 8 (iii. 1500), delirium lasting for a week after the operation in a man, aged 67 (v. 2635), orchitis in men, aged 21 and 30 (iv. 1730 and 3292), acute parotitis (non-suppurative) in a man, aged 19 (iii. 3267), wound of the vas deferens in a man, aged 31 (iii. 622).

Two other cases worthy of note were that of a man, aged 21, in whom the hernia projected into the sac of an enlarged tunica vaginalis (iii. 182); and a woman, aged 90, who was admitted with a history of five days constipation and three days vomiting; for two days no flatus had been passed. There was a small soft hernia with a slight impulse. The sac was opened, and the hernia was found to have slipped back into the abdomen; a radical cure was performed and the patient made a good recovery, leaving the hospital on the twenty-ninth day after the operation.

These last twelve cases were all cases of inguinal hernia.

Radical cure of irreducible hernia was performed twenty-three times, without a death or any other serious complication. (These cases do not include the cases of strangulated hernia in which a radical cure was performed at the same time as the herniotomy for strangulation.)

In the case of a man, aged 54, with an inguinal hernia, some temporary insanity followed the operation. (v. 1403.)

In that of a carman, aged 44, with a hernia as large as a cocoa nut, the sac was very thick, and the testis, which was not recognised, was removed with it.

In a woman, aged 48, with a femoral hernia, the appendix vermiformis formed part of the contents of the sac. (v. 1804.)

COLOTOMY.

Inguinal colotomy was performed twenty-one times, with one death. (One of the cases was in a medical ward and does not appear in Table I.)

For **MALIGNANT DISEASE** it was performed nineteen times, with one death; for **FIBROUS STRICTURE** of the rectum once, and for **CHRONIC INTESTINAL OBSTRUCTION** of uncertain nature once; both these patients recovered.

For **MALIGNANT DISEASE** of rectum or sigmoid flexure a woman, aged 58, was admitted with constipation of seven days' duration and a history of two years occasional diarrhoea and other symptoms of cancer of the rectum. On admission the abdomen was distended and tender. Colotomy was performed on the day after admission. Numerous nodules of new growth were felt in the peritoneum. No glass rod was used; the gut was opened at once. The patient gradually sank and died on the second day after the operation. There was no post-mortem. (ii. 114, and Medical Register.)

The following five female cases all recovered.

A woman, aged 39, with symptoms of four months' duration and some distension underwent colotomy on the second day after admission; no glass rod was used; the gut was opened at once, and the patient left the hospital forty days later. (ii. 222.)

A woman, aged 41, who had had more or less constipation for nine months, but who had not much distension, underwent colotomy three days after admission; no glass rod was used; the gut was opened at once. (ii. 463.)

A woman, aged 49, with symptoms of several months' duration, but no distension, underwent colotomy twelve days after admission; no glass rod was used; the gut was opened three days after the operation. (ii. 2560.*)

A woman, aged 24, with symptoms of six months' duration, but no distension, underwent colotomy eleven days after admission; no glass rod was used; the gut was opened on the fifth day. (iii. 519.)

A woman, aged 35, who had had for twenty-two months pain, for nine months hæmorrhage, and for two months continuous diarrhœa, underwent colotomy four days after admission; no glass rod was used; the gut was opened five days later; an abscess was subsequently opened in the ischio-rectal region, and the patient left the hospital fifty days after admission with a small fistula still present. (ii. 879.)

A woman, aged 63, with symptoms of two months' duration and a good deal of distension, underwent colotomy fourteen days after admission; a glass rod was put through the mesentery and the gut opened at once. (iv. 1242.)

The following twelve male cases all recovered.

A man, aged 61, with symptoms of two years' duration, underwent colotomy seven days after admission; the abdomen was moderately distended; a glass rod was used and the gut opened on the fourth day. (i. 1114.)

A man, aged 62, with symptoms of a year and a half and an extensive fixed mass of growth, but no obstruction, underwent colotomy thirteen days after admission. A glass rod was used and the gut opened on the seventh day. He left the hospital on the fifteenth day after the operation, much relieved. (i. 2160.)

A man, aged 58, with symptoms of about eight months' duration, underwent colotomy five days after admission. No glass rod was used; the gut was opened on the fourth day. (ii. 549.)

A man, aged 54, with symptoms of at least two months' duration, underwent colotomy four days after admission. No glass rod was used; the gut was opened at once. (ii. 621.)

A man, aged 64, had undergone excision of the rectum twenty months previously at another hospital; he had been well for six months, then recurrence was noticed; there was no obstruction, although constipation had been increasing lately. Operation four days after admission; no glass rod used; gut opened at once. Recovery complicated by a little cystitis. (ii. 1276.)

A man, aged 54, with symptoms of four months' duration. Operation four days after admission. A glass rod used and gut opened on the fourth day. (ii. 1518.)

A man, aged 20, had had for eight months diarrhœa and recently slight distension; a growth could be felt encircling the bowel. Operation two days after admission. No glass rod used. Gut opened on second day after operation. (ii. 2537.)

A man, aged 47, had had symptoms for seven months. There was a considerable mass of growth in the rectum, but no obstruction. Operation nine days after admission. No glass rod used; gut opened on the third day. (ii. 3320.)

A man, aged 30, had had symptoms for six months. An ulcerated mass of carcinoma felt in rectum. No distension. Colotomy two days after admission. No glass rod used. Gut opened on seventh day. (iii. 964.)

A man, aged 49, had had symptoms for one year. Several attacks of constipation. No distension. Colotomy sixteen days after admission. No glass rod used. Gut opened on fifth day. Ten days later some hernia of omentum occurred, which was tied and removed. (iv. 475.)

A man, aged 50, had had symptoms for eleven months. Slight distension. Colotomy three weeks after admission. Gut opened on third day. A glass rod used. (iv. 1305.)

A clerk, aged 50, had had symptoms one year. No distension. A glass rod used. Gut opened fifth day. (iv. 3031.)

For FIBROUS STRICTURE.

A woman, aged 58, had undergone excision of rectum for carcinoma three months previously. (See last year's report, p. 162.) Colotomy three days after admission. No glass rod used. Gut opened on third day. A good recovery followed. (ii. 389.)

For CHRONIC INTESTINAL OBSTRUCTION.

A woman had had symptoms of chronic obstruction for twelve months. Nothing felt in abdomen or rectum. Considerable distension. Colotomy on day after admission. A glass rod used and gut opened at once. A good recovery followed. (iii. 2887.*)

Median colotomy was performed twice; one patient died.

For CONGENITAL STRICTURE OF RECTUM.

A male infant, aged 2 months, was admitted pale, collapsed and emaciated, with a history of more or less constipation since birth, absolute for about fourteen days. The abdomen was greatly distended, but there was no vomiting. The anus and lower part of the rectum appeared normal. Colotomy was performed in the middle line, the gut being opened at once; much fecal matter and gas escaped. For some hours the child seemed to be doing well, but then died suddenly. At the post-mortem, there was general peritonitis. The whole of the large intestine was much hypertrophied and dilated down to a point three inches above the anus; from this point downwards the gut rapidly narrowed to a point one inch above the anus, where it was so narrow that it barely admitted an ordinary catheter. The stricture was clearly congenital. The gut had been opened eight inches above the stricture. (iii. 2254.)

For CHRONIC INTESTINAL OBSTRUCTION.

A woman, aged 57, was admitted to a medical ward for chronic intestinal obstruction; for about five years she had complained of vague abdominal pains; for eighteen months she had had attacks of severe pain after food; two weeks before admission an unusually severe attack of pain was followed by slight jaundice. On admission there was some jaundice and abdominal distension with much constipation; on the eighth day after admission an incision as for left inguinal colotomy was made and undistended sigmoid flexure found; a second incision was then made in the middle line below the umbilicus, and distended colon drawn out and opened at once and a tube tied in. No cause of obstruction could be found. The patient made a good recovery, and left the hospital four months later, having gained flesh and passing her motions partly through the fistula and partly per vias naturales. (Med. Statistics and Med. Register Vol. II., No. 30.)

ABDOMINAL SECTION.

For tuberculous peritonitis. — A girl, aged 16, was admitted with painless, symmetrical and considerable distension of the abdomen; a transverse band of thickened omentum could be felt just above the umbilicus. The swelling had been taken for an ovarian cyst. The abdomen was drained, and the patient made an excellent recovery, leaving the hospital on the twenty-sixth day after the operation, and being quite well when last heard of about a year after the operation. (iii. 297.)

A man, aged 24, had had chronic peritonitis for several years; abdominal section was performed, an intra-peritoneal abscess being opened and drained. The patient did well, but discharged from the hospital two months after the operation, before the sinus had healed. (i. 3819*.)

A groom, aged 20, was transferred from a medical ward with tuberculous peritonitis of seven months' duration. Vomiting and distention had recently become much worse. The abdomen was opened, and the intestines found much matted together. Much broken-down caseous material was removed, and the peritoneal cavity washed out and drained. For a day or two the patient improved, then the discharge from the wound became faecal, and the patient gradually sank and died on the ninth day after the operation. The post-mortem showed the usual appearances of chronic tuberculous peritonitis. There was also slight double hydronephrosis. (iii. 2463.)

A missionary, aged 24, was admitted very ill with chronic peritonitis of six weeks' duration. The abdomen was opened and drained, many pints of clear serous fluid being let out. Three similar operations were performed at intervals during the next five months. The case was believed to be tuberculous, but at the last operation much soft material was seen in the peritoneum, which it was thought might perhaps have been malignant growth. The patient became gradually more and more emaciated, and finally died six months after admission, and six weeks after the last operation. (i. 3432*.)

For perforative peritonitis.

FOR PERFORATED GASTRIC ULCER the abdomen was opened only once.

An unmarried girl, aged 21, three hours after eating some cake, had been suddenly seized with violent pain in the abdomen, followed by vomiting and complete constipation; she immediately went to bed, and remained lying down until the evening of the second day, when she was brought to the hospital. The pain, vomiting and constipation had persisted. On admission she was collapsed, and looked very ill; the abdomen was much distended and tender. Perforation of a gastric ulcer being diagnosed, the abdomen was immediately opened, fifty hours after the first onset of symptoms. After some searching, a small perforation was found on the anterior surface of the stomach near the oesophageal end of the lesser curvature. There was a little lymph in the immediate neighbourhood of the perforation, and a little on the colon. There was also a little blood-stained fluid in the peritoneal cavity. The perforation was closed with four Lembert silk sutures. The immediate neighbourhood of the wound was washed with sterilised water, the rest of the peritoneal cavity not touched. No drain was used. A good recovery followed, and the patient left the hospital quite well on the thirty-fifth day. Six months later she was still quite well. (iv. 1523.)

PERFORATED TYPHOID ULCER.—A man, aged 37, who was convalescent from typhoid fever (twelfth week) was transferred from a medical ward on account of symptoms of perforation of the intestine. He had been suddenly seized with pain and distension of the lower half of the abdomen. The whole abdomen was very tender. Temperature normal. The abdomen was opened in the middle line. The coils of intestine in the right iliac fossa were matted together. On separating them, foul pus escaped freely. A round perforation about 3 mm. in diameter was seen in the small intestine opposite the mesentery. The edges were pared, and the hole closed by a single row of nine sutures. The abdomen was thoroughly washed out with sterilised water, and drained by a glass tube. The drainage tube was removed two days later. The patient made an excellent recovery, and left the hospital on the sixty-ninth day after the operation, quite well. (iv. 2916*.) (This case is in the Medical Statistical Tables, and consequently does not appear in Table I. of the Surgical Report.)

For PERITONITIS DUE TO OTHER CAUSES the abdomen was opened once.

A woman, aged 28, had had a very large ovarian cyst removed in the hospital two years previously; since that time she had had a child, and had considered herself to be quite well until one month before admission, when she first noticed that the abdomen was beginning to swell; she was admitted on account of great and uniform swelling of the abdomen (girth forty-five inches); per vaginam and per rectum numerous hard masses could be felt. There was also some œdema of both legs. On the fourth day after admission an incision was made into the abdomen, and over twenty pints of clear serous fluid evacuated. The peritoneum was found studded with numerous small flat nodules. The wound was closed. For seven days the patient seemed to be doing very well, and temperature remained perfectly normal; then the latter began to rise, and the abdomen again became distended; vomiting, pain and rapidity of pulse set in. Eleven and a half pints of blood-stained fluid were removed by tapping, but the patient died collapsed on the ninth day after the operation. The post-mortem showed great thickening of the peritoneum from old chronic peritonitis and recent acute peritonitis; the microscope showed the above-mentioned nodules to be inflammatory, not malignant. (Martha 275.)

For hydatid of the liver, abdominal section was performed four times, in all cases with success.

A woman, aged 43, had had for eighteen months a swelling in the right side of the abdomen, and for three months much pain. On admission there was a large rounded tumour just below the liver, and easily felt in the loin. Abdominal section showed it be a hydatid attached to the under surface of the liver. It was stitched to the abdominal wall, opened and drained, a large number of dead hydatid cysts being removed. No attempt was made to remove the cyst wall. The patient made an excellent recovery, leaving the hospital on the seventy-first day after the operation with a small sinus not quite closed. (ii. 1637A.)

A gardener, aged 60, was admitted with a large abdominal tumour, which he had first noticed two months before; for five months he had been subject to attacks of severe abdominal pain, without jaundice or renal or intestinal symptoms. The abdomen was opened, and a large cyst attached to the under surface of the liver opened and drained. It contained thin dark blood-stained fluid without any solid contents. The patient made a good recovery, and left the hospital fifty-two days after the operation, but still wearing a drainage tube. The exact nature of the cyst was never clearly ascertained, but it was thought to be probably hydatid. (ii. 2196.)

A boy, aged 9, had noticed a swelling in the region of the liver for seven weeks. Direct incision into the abdomen showed a hydatid of the liver. The endocyst was removed; it contained clear fluid, but no daughter cysts. The ectocyst was stitched to the abdominal wall, and drained for eighteen days. The patient made a good recovery, the cavity gradually contracted, and the patient left the hospital fifty-four days after the operation with a small sinus nearly closed. (iii. 3567.)

A boy, aged 9, was admitted with a swelling in the left lobe of the liver, slowly increasing. It was aspirated and some clear non-albuminous fluid withdrawn. Five days later the abdomen was opened, and the hydatid shut off from the general peritoneal cavity by sewing omentum round it. Eight ounces of clear fluid were then withdrawn with a trocar, an incision made into the cyst and the endocyst. The ectocyst was sewn to the abdominal wall and drained. The cavity slowly closed up, and the patient left the hospital on the fifty-first day after the operation with the wound healed. (ii. 3745*.)

Cholecystotomy was performed four times, with no deaths.

A coal-dealer, aged 33, had had for two years attacks of pain in the abdomen, just below the ribs, and for one year had had frequent vomiting; six weeks before admission he had had an attack of jaundice. On admission

he was a healthy-looking man, slightly jaundiced; nothing definite could be felt in the abdomen. Two slight attacks of apparently biliary colic occurred, and eleven days after admission an incision was made in the middle line of the abdomen, just below the sternum; nothing was found, and the wound closed. A second incision was made over the gall bladder, which was found dilated, and was opened and sewn to the abdominal wall. No stone was found, but there appeared to be some thickening about the common bile-duct near the pancreas. The patient made a good recovery, and left the hospital on the fifty-third day after the operation with the fistula healed. (v. 2502.)

A woman, aged 60, had had for four months frequent attacks of jaundice and biliary colic, with much pain. On admission the gall bladder was distended, and the liver large; the patient was slightly jaundiced. The gall bladder was opened, slit down to the duct, and ten faceted stones removed. The gall bladder was sewn up with Lembert's sutures, and drained; the peritoneal cavity was not drained separately. The patient made an excellent recovery, without any bad symptoms, and left the hospital on the thirty-first day after the operation with the wound soundly healed. (v. 1148.)

A woman, aged 57, had had for many years a lump in the right iliac region; in the last six months it had grown much larger, and there had been some pain and loss of flesh. On admission a hard tumour about as large as an orange was felt to the right of and below the umbilicus. No definite diagnosis of its nature was made. When the abdomen was opened it was found that the tumour was adherent to the anterior abdominal wall in front, to the hepatic flexure to the left, and to the gall bladder above; it was irremovable, so an incision was made into it, and about an inch and a half of thick cheesy pus let out; the cavity then appeared to be the cavity of the gall bladder. The wall was about a quarter of an inch thick, and partly calcified. It was stitched to the abdominal wall and drained. Microscopic examination showed no malignancy. After the operation, bile escaped from the wound. The patient made a good recovery, and left the hospital three months after the operation with a fistula still open. (Martha 432.)

A man, aged 37, with a history of persistent jaundice and emaciation for eleven months, was admitted with enlargement of the liver and distention of the gall bladder. Cholecystotomy, performed a month after admission, gave him some relief, and he left the hospital two months later with a biliary fistula; the jaundice had diminished, but not wholly disappeared. (Medical Statistics and Medical Register, iii. 69.)

Bullet wound of stomach.—A woman, aged 20, had been shot with a revolver seven hours after a meal. Four and a half hours after the accident the abdomen was opened, and two wounds found at the lower part of the pyloric end of the stomach. These were sutured, and the abdominal cavity drained. No gastric contents were seen in the abdominal cavity. The patient rallied from the operation, but the temperature rose steadily, the abdomen became distended, and she died four days later. The abdomen showed little peritonitis, but four more bullet wounds, all in the third part of the duodenum. These had set up retro-peritoneal cellulitis. The wounds in the stomach were firmly closed. The bullet was found in the muscles of the back. (v. 2174.)

Gastrostomy was performed three times for epithelioma of the œsophagus.

A cabinet-maker, aged 61, had had for thirteen weeks dysphagia, and other symptoms of carcinoma of the œsophagus. A month after admission gastrostomy was performed by Albert's method of drawing the stomach through a second smaller incision over the lower ribs; the stomach was opened at once. Before the operation he was very weak and emaciated, and was gradually getting worse. After the operation he became steadily weaker, had frequent hæmoptysis and was much troubled by the escape of gastric juice. He died on the fifteenth day after the operation. There was no post-mortem. (i. 1181.)

A man, aged 65, had had dysphagia for eight months; for six months he had been wearing a Symonds' tube, and having it changed once a month. He had been in the hospital before (see last year's statistics), but was re-admitted because he had swallowed the cord holding the tube. He was able to swallow only liquids, and with difficulty. All attempts to fish up the cord failed. Five days after admission gastrostomy was performed in two stages, the stomach being sewn to the abdominal wall by two rows of sutures, and opened on the second day. Subsequently, he could take food by the mouth for a time, but then the dysphagia again increased, and he had to be fed through the wound, owing to perforation having taken place into the trachea. There was much trouble owing to the escape of gastric juice through the wound. The patient gradually sank, and died on the twenty-seventh day after the operation. The post-mortem showed that the stomach was firmly fixed to the abdominal wall; there was considerable ulceration of the skin around the fistulous opening; otherwise the local condition was excellent. The epithelioma involved three inches of the œsophagus from the position of the bronchus upwards. The growth had caused a large perforation into the trachea. The Symonds' tube was found lying in the stomach. (v. 942.)

A blacksmith, aged 50, had had for three months dysphagia and vomiting; on one occasion he had brought up a pint (?) of blood, for twenty-four hours he had been unable to swallow anything at all. There were symptoms of perforation of the trachea, any attempt to drink causing immediate and violent coughing. He had not been treated by tubes. His general condition was good. Two days after admission gastrostomy was performed, the stomach being united to the abdominal wall by a double row of sutures, and opened on the second day. The temperature gradually rose from the time of operation, and the patient died six days later with pneumonia. The post-mortem showed an extensive epithelioma with a fistulous opening into the trachea; there was no general peritonitis, but there was a slight amount of suppuration in connection with a stitch leading from the wound into the peritonea! cavity. (v. 1527.)

Gastro-enterostomy.—There were two cases.

A baker, aged 55, gave a history of two months vomiting and loss of flesh; a few days before admission he had vomited some coffee ground material. An ill-defined swelling could be felt in the region of the pylorus. After a consultation with the physicians, an exploratory exploration was performed. The stomach being found dilated, and a stricture of the pylorus being apparently palpable, the jejunum and anterior wall of the stomach were united by a Murphy's button. The patient was much collapsed after the operation, and died on the following morning. A partial post-mortem showed that the button was holding well; the stomach was dilated, but no stricture could be found. (iii. 1001.)

A clergyman, aged 41, was admitted on account of pain and vomiting after food. For twenty years he had suffered from dyspepsia, for two years he had had frequent vomiting and occasional hæmatemesis. In the last six months he had lost a little flesh. He was treated for three weeks in a medical ward, and then transferred to a surgical one. He was a fat, but unhealthy looking man. In the region of the pylorus an indistinct lump could be felt. Gastro-enterostomy was performed, a large oval Murphy's button being used. The operation was exceedingly difficult owing to a large amount of subcutaneous and subperitoneal fat. The anterior surface of the stomach was united to a piece of small intestine, subsequently found to be only three feet from the ileo cæcal valve. After fixation of the button it was found that there was some protrusion of mucous membrane, so some additional sutures were inserted. The patient died collapsed nine hours after the operation, with a temperature of 102°. At the post-mortem, a shallow malignant ulcer was found near the pylorus, and a small secondary growth in the liver. The stomach was of normal size, and the pylorus admitted a forefinger. (v. 3173.)

Pylorotomy was performed once.

A woman, aged 39, had had dyspepsia, abdominal pain and vomiting, more or less constantly for two years; for three months she had been aware of a tumour in the region of the pylorus. On admission she was thin, and looked delicate. A moveable hard mass could easily be felt in the pyloric region. The abdomen was opened in the middle line, and resection of the pylorus performed. The growth, which was carcinomatous, involved also the transverse colon, so a portion of this was also resected. The portions removed comprised two and a half inches of stomach, one inch of duodenum, and five inches of colon. Both resections were done with silk sutures, without the use of any "button." The operation lasted one and a half hours. The patient never rallied, and died forty hours afterwards with a temperature of 102°. At the post-mortem there was no evidence of peritonitis. The stomach and duodenum were found accurately united, but much stricture had been produced by the sewing. At the wound of the colon there was little or no sign of repair; two of the stitches had given way, apparently from the pressure of a lump of fæces impacted just above them. There was some malignant infiltration of the lumbar glands, and a small nodule in the pancreas; otherwise the disease had been completely removed. (ii. 1765.)

For acute intestinal strangulation (by a band) abdominal section was performed three times; two patients died, and one recovered.

A shop assistant, aged 19, who had had occasional severe abdominal pain during the preceding year, was suddenly seized forty-five hours before admission with symptoms of acute intestinal obstruction. Laparotomy was performed at once, several bands of old adhesions were found, but no definite constriction. The operation lasted one hour. The patient was much collapsed, and died twelve hours later. The post-mortem showed old tubercle in the lung and mesenteric glands. Old peritonitis had caused many bands of adhesions; one of these passed from the small intestine four feet below the pylorus to a point on the mesentery, near the ileo cæcal valve. The whole of the intervening intestine had been strangulated, and it was almost gangrenous. The strangulated portion had been partially reduced by the operation. The appendix was normal. (i. 1189.)

A portmanteau-maker, aged 18, was admitted very ill with intestinal obstruction. For six months he had been constipated. Seven days before admission he had been suddenly seized with acute pain followed by vomiting and absolute constipation. On admission there was great distension, faecal vomiting and collapse. The abdomen was opened at once, and a portion of small intestine found to have been strangulated by a ring of omentum. Reduction was effected, but the patient died a quarter of an hour afterwards. There was no post-mortem. (iii. 2252.)

A girl, aged 13, was admitted with the following history. Two years ago she had had a somewhat similar attack; had been laid up for six weeks and had recovered. Eleven days before admission some abdominal pain set in, and vomiting continued on and off from that time until the day before admission, when she became much worse and complete constipation set in. She was admitted to a medical ward, whence she was transferred on the following day. The abdomen, which was now moderately distended, was at once opened in the middle line; there was some clear fluid in the peritoneal cavity, and some congestion of the intestines. A band as large as a goose quill was found passing from the umbilicus downwards to the right, and constricting, although not tightly, part of the small intestine; it was tied and divided, and proved to be a Meckel's diverticulum. The patient made a good recovery, and left the hospital quite well twenty-nine days later. (iv. 1772.)

For Intussusception the abdomen was opened three times; one patient recovered.

A male infant, aged 2 years and 8 months, was admitted with typical symptoms of intussusception of thirteen and a half hours' duration; the tumour was felt below and to the right of the umbilicus. After unsuccessful attempts at reduction by injection, laparotomy was performed, and reduction effected; the operation lasted twenty minutes. The child made an excellent recovery, and left the hospital twenty-two days later. (i. 1365.)

A male infant, aged 4 months, was quite well until nine and a half hours before admission, when it was suddenly seized with pain and vomiting, followed six hours later by the passage of blood per anum. On admission, a tumour was felt per rectum and in the abdomen. Injection of milk and water having failed, the abdomen was opened fifteen hours after the first onset of symptoms. The intussusception was found, but could not be reduced on account of the adhesions. The wound was therefore closed, and the child died a few hours later. There was no post-mortem. (i. 2185.)

A male infant, aged 6 months, had had, for three weeks on and off, vomiting after food and passage of blood and mucus per rectum. He was admitted to a medical ward for one day; the intussusception was felt per rectum, and partially reduced by injection, under an anæsthetic. The tumour, however, could be felt again next day, so the abdomen was then opened and the intussusception reduced, apparently completely; the patient died a few hours later, and at the post-mortem it was found that about two inches of an ileo caecal intussusception still remained unreduced. It appeared from the condition of the intussusception that the strangulation had existed altogether about forty-eight hours. (iv. 1023.)

For *Appendicitis*.—The number of operations upon the appendix vermiformis has increased from ten in 1895 to forty-three in 1896. The classification of these operations has this year been somewhat altered and extended. The cases in Table II., with two exceptions mentioned below, are also recorded in Table I. The two exceptions are recorded in the medical statistics, and appear only in Table II. of the surgical report. All operations, whether large or small, performed upon the appendix during the year, in either medical or surgical wards, have, for convenience, been placed together in Table II., as was also done last year.

I.—ACUTE APPENDICITIS WITH SUPPURATION.

(a) *Free incision into peritoneal cavity, removal of appendix, washing out and drainage.*

Seven cases; three recoveries.

Recoveries.

A boy, aged 9, was admitted with acute appendicitis. No previous attack. Constipation seven days, vomiting four days, abdominal pain three days. Kept one day in medical ward, then transferred. The patient looked ill; the abdomen was distended and tender everywhere, but especially in the right iliac fossa. No definite swelling could be felt. The abdomen was at once opened in the middle line; turbid serum at first escaped, then thick pus with flakes of lymph from the region of the appendix. The appendix was drawn into the wound, found to be acutely inflamed and perforated an inch from its tip. The appendix was removed and the stump sutured with Lembert's stitches. The abdominal cavity was thoroughly washed out with boracic lotion and drained. The temperature, which was 99° before operation, rose to 101° afterwards, varied between 100° and 101° for the first week, and then remained practically normal. The patient made an excellent recovery, and left the hospital on the thirty-seventh day quite well, and with the wound healed. (ii. 1022.)

A boy, aged 13, was admitted very ill with acute appendicitis and peritonitis. For three weeks he had been complaining of constipation and pain in the right iliac fossa; three days before admission the pain became more

severe. On the day of admission he vomited several times. The abdomen was motionless, slightly distended and very tender, especially in the right iliac fossa. Temp. 100.8° , p. 120. Within a few hours of admission the abdomen was freely opened in the right semi-lunar line, and offensive pus at once let out from the peritoneal cavity. The coils of intestines near the cæcum were matted together with lymph, but elsewhere no lymph or adhesions were seen. The appendix was found thickened and perforated near its tip; it was tied and removed, and the peritoneal cavity thoroughly washed out with boracic lotion and drained, the drainage tube passing into the recto-vesical pouch. For the first two or three days the patient was very ill, vomiting frequently, very restless, delirious, shouting and swearing continually. His temperature, however, remained low, being rarely over 99.5° ; the pulse, at first 140, was below 100 by the fifth day. The vomiting and restlessness gradually decreased, and after the fifth day the boy began to make rapid progress towards recovery. For the first five days he was fed by nutrient enemata. The subsequent convalescence was excellent, and he left the hospital by the forty-fourth day after the operation quite well, and with the wound almost healed. When seen again some weeks later he was perfectly well. (v. 2850.)

A woman, aged 21, was quite well until twelve days before admission; since that time she had had abdominal pain and swelling, and had kept her bed. On admission she seemed ill, the abdomen was distended, and the lower part of it not moving; considerable induration was felt here and also within the pelvis. Pulse 110, temp. 102° . The abdomen was opened freely, and much foul pus let out from an abscess in Douglas's pouch; the appendix was removed, and the abdominal cavity freely washed out and drained. A good recovery followed. (Martha 370.)

Deaths.

A girl, aged 10, eight days before admission, fell out of bed. She had had pain in the right groin ever since, with slight constipation and occasional vomiting. On admission she looked pinched and ill. There was pain and tenderness in the right iliac fossa, where a definite round lump could be felt. With rest in bed the pain and tenderness diminished considerably, but increased again on the third day. Temp. below 100° . On this day a nearly vertical incision was made into the abdomen in the right semi-lunar line, and an abscess opened with the finger; an attempt was made to shut off the general peritoneal cavity with sponges. The appendix and a concretion were removed, the former in a sloughy condition. The patient was much collapsed after the operation, never rallied, and died in twelve hours. The post-mortem showed a localised abscess around the appendix; it had been freely opened into the general peritoneal cavity, which contained much pus. (ii. 713.)

A female bookbinder, aged 19, while at work was suddenly seized with abdominal pain; she vomited twice, and was admitted to the hospital a few hours later. The pain continued, without vomiting, and the temperature rose to 103° . She had never had a previous attack. About forty hours after onset of symptoms the abdomen was opened. At the time the general condition was good, but there was considerable pain and tenderness over the lower half of the abdomen, which was kept rigid. There was fulness in the right iliac fossa, but no very distinct tumour. The abdomen was opened in the semi-lunar line, a little thin pus escaping. The appendix, which was red and cedematous, was tied and removed, and the general peritoneal cavity washed out and drained. For a few hours the patient seemed to be doing fairly well, then the pulse and temperature rose to 180 and 102° respectively, jaundice and delirium set in, and the patient died on the second day after the operation and fourth from the beginning of the illness. The post-mortem showed death from acute septic absorption from the general peritoneal cavity. (iii. 2260.)

A man, aged 24, gave no history of any previous attack. Three days before admission, after supper, he felt sudden pain in the right iliac region; this gradually increased. The patient was sick once on the day of admission. On

day of admission his general condition was fairly good. There was much tenderness in the right iliac fossa, and apparently slight general peritonitis. The abdomen was opened, pus found in the right iliac fossa and pelvis; the rest of the peritoneum was injected. The appendix, which had perforated, was removed, and the abdomen washed out. The patient became much collapsed soon after the operation, and died in nine hours. The post-mortem showed evidence of old suppuration around the appendix, and recent general peritonitis. (v. 459.)

A porter, aged 17, was admitted with acute appendicitis, apparently the first attack. Eight days before admission he ate a number of unripe pears. Next day he complained of pain in the abdomen. On the following day the bowels were opened for the last time, and he began to vomit. He was treated outside the hospital with aperients and enemata, and got worse. On admission there was general abdominal pain with slight distension and tenderness. Nothing could be felt per rectum. The abdomen was immediately opened in the semi-lunar line, an abscess found in connection with the appendix and opened. The incision was then enlarged and the appendix found to be perforated; it was tied and removed, and the abdominal cavity thoroughly washed out with warm water and drained. The peritoneum had not lost its lustre, and the intestines were but slightly distended. The operation lasted about an hour, and towards the end of it the patient became much collapsed. Afterwards he was very restless and noisy, and died in eleven hours. Temperature, pulse and respiration before operation were 100·6°, 112 and 28 respectively; afterwards 103·6°, 148 and 36. The post-mortem showed recent general peritonitis with matting together of the intestines in the right iliac fossa. (v. 2291.)

(b) Free incision and washing out; no search for the appendix.

Three cases; no recoveries; all three patients were desperately ill on admission.

A boy, aged 8, had for ten days been languid and feeling ill; for two days he had had abdominal pain; he had not vomited. On admission his temperature was 103°, and he looked ill, with abdominal facies and small running pulse. The abdomen was tense and tender all over; his hands, however, were not cold; there were no localising signs. He was kept twenty-four hours in a medical ward, and during that time he vomited three times. The condition of the abdomen did not alter. Pulse 150, temp. 100·6°. He was then transferred to a surgical ward, and the abdomen was immediately opened in the middle line, pus escaping directly the abdominal cavity was opened, and welling up mainly from the right iliac fossa. The appendix was felt but not removed. The abdomen was thoroughly irrigated with boracic lotion and drained. After the operation the boy was extremely restless, shouting and swearing continually. The dressings were soon soaked with pus. He rapidly sank and died, with a temperature of 101·6, about twelve hours after the operation. (ii. 1896.)

A boy, aged 12, was admitted in a moribund condition with perforative peritonitis. He had been quite well until four days previously when he complained of pain in the abdomen. On the following day the pain was worse; vomiting set in and continued from that time onwards. On admission he was much collapsed, with an almost imperceptible pulse. The abdomen was immediately opened and a large quantity of foul fluid let out from the peritoneal cavity. The tip of the appendix, felt with the finger, appeared to be normal. The abdomen was washed out with warm water and drained. The patient died two hours later. At the post-mortem, the base of the appendix was found to have sloughed, and set up general peritonitis. (iii. 550.)

A boy, aged 6, was said to have been in his usual health until two days before admission, when he woke up suddenly with severe pain in the abdomen. He was given castor oil, and promptly began to vomit; on the next day the abdomen became distended, and as the vomiting, pain and constipation continued, he was brought to the hospital on the evening of the third day. He

was then extremely ill, with sunken face, very rapid pulse and distended, almost motionless, abdomen. The umbilicus was red. Temp. 101.8° , soon falling to 98.6° . The diagnosis between appendicitis and tuberculous peritonitis was somewhat uncertain. Within a few hours of admission the abdomen was opened in the middle line and much pus let out; the pus came chiefly from the right iliac fossa, where some enlarged glands could be felt. The appendix was not seen or looked for. The general peritoneal cavity was irrigated with boracic lotion and drained. After the operation the boy became very restless, the temperature rose rapidly to 104° , and the boy died nine hours after the operation. The post-mortem showed a perforated appendix, which had caused a localised abscess as large as a hen's egg. This had leaked into the peritoneal cavity. It seemed probable that the abscess had existed much longer than the history indicated. (iv. 3723.)

(c) *Free incision and drainage; no washing out; no search for the appendix.*

Two cases; no recoveries.

A man, aged 24, was admitted very ill with peritonitis and appendicitis. The attack, which was a first one, had begun acutely five days previously. He had been treated outside the hospital by smart purgatives; violent pain, vomiting and constipation for five days were the result. On admission the patient looked very ill, but was not restless or collapsed. The abdomen was greatly distended; no distinct abscess could be felt. Temp. 102.2° . The abdomen was opened by a vertical incision, the upper end of which was exactly midway between the anterior superior spine and the umbilicus. About twelve ounces of pus were let out and the wound drained; no washing out, and no search for the appendix. The patient died in a few hours, and the post-mortem showed that there had been a very large abscess in connection with concretions in the appendix. The abscess had been shut off by adhesions. The incision had been made partly through adherent peritoneum, partly through non-adherent peritoneum, and had thus allowed extravasation of fetid pus into the general peritoneal cavity. (iv. 2277.)

A tailor, aged 19, who had never had any previous attack, was suddenly seized with abdominal pain three days before admission. He took purgatives, and began to vomit. On the following day the abdomen became distended. Vomiting continued; the bowels were opened after an enema administered outside the hospital; next day, another enema, and he became still worse; he was then admitted, very pale and looking ill. He was not restless, and was able to give a clear account of his illness. Abdomen moderately distended and slightly tender, movement slight. The abdomen was immediately opened by incision in the semi-lunar line; at first, thin purulent fluid escaped from the peritoneal cavity, and on passing a tube deeply towards the iliac fossa a quantity of very fetid pus came out. A drainage tube was inserted, and some of the fluid sucked out. The patient was greatly collapsed; no washing out was done, and no search made for the appendix. The operation lasted about half an hour. The patient never recovered from the collapse, became very restless, and died in three hours. No post-mortem. (v. 3044.)

(d) *Limited incision through peritoneal adhesions; no removal of appendix.*

Thirteen cases; ten recoveries.

In most of these cases the incision was made very low down, parallel with and just above the outer half of Poupart's ligament.

Recoveries.

A painter, aged 23, had had for twelve days pain in the right groin, accompanied at first by nausea, afterwards by a swelling in the right iliac fossa. On admission a distinct swelling could be felt, and there was no evidence of general peritonitis. A small incision was made through the abdominal wall into the abscess, the healthy peritoneum not being opened; the wound was drained for a few days, and the patient made a good recovery,

leaving the hospital on the thirty-second day after the operation with the wound soundly healed. When seen again three weeks later he was quite well and able to go to work. (i. 963.)

A schoolboy, aged 9, had had at least one previous attack of appendicitis. Three days before admission acute pain in the right iliac fossa set in. On admission the abdomen was not distended, a distinct fulness could easily be felt in the iliac fossa. Temp. 100°. Three hours after admission an incision was made through the adhesions into a localised abscess cavity. The appendix was not seen or felt. The cavity was washed out and drained. The patient made an excellent recovery, leaving the hospital four weeks later with the wound soundly healed. (Med. Statistics and Med. Register, i. 169A.)

A girl, aged 19, was admitted on the eleventh day of a first attack of acute appendicitis. The illness had begun suddenly with severe abdominal pain and vomiting; constipation at first, then diarrhoea. On admission the abdomen was distended, painful and tender; in the right iliac region was a large swelling extending nearly to the middle line, and upwards to the level of the umbilicus. Temp. 103°. An incision was at once made low down near the anterior spine, and several ounces of fetid pus evacuated. Some bits of sloughing appendix and a small concretion were removed with the pus. The abscess was shut off by abundant adhesions from the rest of the general peritoneal cavity. The patient made a slow but good recovery, and left the hospital one hundred and twenty-one days after admission with a small sinus not quite healed; she was otherwise quite well. (ii. 1010.)

A carman, aged 24, had had for three days severe pain in the right iliac fossa and vomiting. No previous attack. On admission the patient looked ill. There was much pain and tenderness in the iliac fossa. The symptoms gradually increased, and on the eighteenth day after admission an incision was made above and behind the anterior spine through the abdominal wall; about an ounce of very fetid pus was let out. The healthy peritoneum was not opened; the appendix itself was not seen or felt. The cavity was drained, and the patient made an excellent recovery, leaving the hospital on the twentieth day after the operation, with the wound healed. (iii. 557.)

A boy, aged 16, was admitted with acute appendicitis; he had been ailing for nearly three weeks; four days before admission he had had an attack of diarrhoea, followed by much abdominal pain; for three days he had been at home in bed. For the first four days after admission the temperature varied between normal and 101°, and a tender painful swelling in the right iliac region became more and more defined. It was then opened through a small incision low down in the semi-lunar line, and about four ounces of foul pus let out. The incision was made through adhesions, care being taken not to break them down. The appendix was not seen or felt. The drainage tube was removed on the fifth day, and the boy made an uninterrupted recovery. (iii. 1844.)

An engraver, aged 20, was admitted on the fifteenth day of an attack of acute appendicitis. On admission the patient had a dry tongue, a pulse of 120. Temp. 99°. The abdomen was distended and not moving with respiration; tenderness and resistance in the right iliac fossa. An incision was made through peritoneal adhesions, and four ounces of fetid pus let out; appendix neither seen nor felt. The patient made an excellent recovery, and was discharged fifty-five days after the operation with the wound soundly healed. (iii. 2412.)

A man, aged 22, woke up suddenly with pain over the whole abdomen, accompanied by vomiting. He stayed in bed, took purgatives and became much worse. Two days later he was admitted to the hospital with general distension and tenderness of the abdomen, and a high temperature. He was kept quietly in bed; the general symptoms rapidly subsided, while local signs in the right iliac fossa became more marked. On the sixth day after admission

an incision was made through peritoneal adhesions into an abscess cavity, from which several ounces of foul pus were evacuated. No search was made for the appendix. The cavity was gently washed out and drained, and the patient made an excellent recovery, leaving the hospital quite well and with the wound soundly healed on the forty-ninth day after the operation. (iii. 2956.)

A girl, aged 18, had had a slight blow on the abdomen fourteen days ago, and had had pain in the right iliac fossa ever since; in the last four days the pain had been much more severe, and a tender swelling had appeared in the iliac fossa. On admission the patient was rather thin, but did not look very ill; in the iliac fossa was a tender painful lump of moderate size; she was kept in bed and the swelling gradually increased in size. On the eighth day after admission an incision was made through adherent peritoneum, and several ounces of slightly offensive pus let out. The cavity was gently syringed and drained for eight days. No search was made for the appendix. Temperature before operation $100\cdot2^{\circ}$, afterwards normal. The patient made an excellent recovery, and left the hospital on the twenty-fourth day after the operation, quite well, and with the wound healed. (iv. 1620.)

A labourer, aged 44, had had no previous attacks. Seven days before admission sudden severe abdominal pain set in, followed by vomiting and more or less constipation. On admission there was in the right iliac fossa a considerable swelling reaching nearly to the umbilicus. Temperature 102° . A small incision was at once made low down, near Poupart's ligament, through adherent peritoneum into the abscess, and many ounces of very foul pus let out. No attempt was made to remove the appendix. The cavity was drained for several days, and the patient made an uninterrupted recovery, leaving the hospital on the twenty-eighth day after the operation, quite well, and with the wound healed. The temperature after the first day was never above 99° . (iv. 1901.)

A man, aged 23, with acute appendicitis of one week's duration, was admitted with a temperature of 103° and a localised intra-peritoneal abscess, which was opened at once, and half a pint of fetid pus let out. The patient made a good recovery and the wound healed in six weeks. (iv. 3699.*)

Deaths.

A male cook, aged 28, had been quite well until two days before admission, when he was seized with abdominal pain followed by vomiting and diarrhoea. On admission there was tenderness and some resistance in the right loin and iliac fossa. Seven days later the swelling was explored with an aspirating needle and foul pus withdrawn; an incision was then made above the crest of the ilium and two ounces of pus let out; the cavity was irrigated and drained. Cellulitis of the back followed, and the patient died of septicæmia on the fifteenth day after the operation. At the post-mortem, the appendix was found gangrenous; it lay wholly behind the peritoneum, and there were no adhesions whatever within that cavity. (ii. 506.)

A boy, aged 7, had been quite well until five days before admission, when he was suddenly seized with abdominal pain and vomiting, and had been gradually getting worse ever since. When admitted he was very ill; the abdomen was much distended, but more so in the right iliac fossa than elsewhere; coils of intestine were visible; there was bilious vomiting. Temperature $102\cdot8^{\circ}$. An incision was made at once into an abscess containing an ounce of pus; a finger was inserted, but the appendix was not felt. No washing out was done. The temperature fell and then rose rapidly to $106\cdot6^{\circ}$, and the patient died in a few hours. The post-mortem showed peritonitis, chiefly localised to the lower part of the abdomen; also recent dissemination of pus over the upper part of the abdomen. The general infection had evidently occurred either just before or at the operation. (ii. 1835.)

A boy, aged 16, was admitted on the third day of a first attack of appendicitis. On admission there was general distension and tenderness of the abdomen. He was kept quiet in bed, the symptoms of general peritonitis subsided while the local signs of a swelling in the region of the appendix became more pronounced. The temperature remained at or below 100°. On the fifth day after admission an incision was made into a localised abscess through peritoneal adhesions, and the cavity washed out and drained. From this time the temperature steadily rose to 105°, the patient became restless and delirious, the abdomen became distended, and the boy died on the fourth day after the operation. At the post-mortem, pus was found diffused over the peritoneal cavity, chiefly in the lower half; the appendix was perforated. (ii. 2019.)

(e) *Limited incision through peritoneal adhesions, with removal of appendix.*

Two cases; both recovered.

A man, aged 53, was admitted with a first attack of subacute appendicitis and an abscess. Nine days before admission he had had a rigor; three days later vomiting set in; two days later still abdominal pain and a swelling in the right iliac fossa were first noticed. It was not at that time at all tender, but had been getting so since. On admission the abdomen was full and somewhat rigid. The patient did not look at all ill. Just internal to the right iliac spine a distinct abscess could be felt. It was very slightly tender. Temperature for the first three days was between 100° and 102°, then fell suddenly to normal, and never again rose above 99° during the remainder of the patient's stay in the hospital. The patient was kept quietly in bed. All tenderness disappeared, and on the seventh day after admission the abscess was opened by an incision parallel to the outer half of Poupart's ligament, and about two drachms of thick pus let out. The appendix was found doubled up and much bound down by adhesions. It was removed and found to be much thickened. There was no concretion in it. The healthy peritoneum was not opened. The patient made an excellent recovery. (ii. 3123.)

A boy, aged 16, had had in the preceding year numerous attacks of appendicitis. The present attack began acutely six days before admission. On admission the abdomen was distended, rigid, tender, and scarcely moving. A large hard lump could be felt in the right iliac fossa. Temperature about 100°. On the third day after admission, the distension having increased still more and the skin being red and œdematous, an incision was made low down in the right semi-lunar line, and an ounce and a half of pus let out from a localised abscess cavity. The appendix projecting into the cavity was tied and removed, and the abscess cavity washed out and drained. The patient made an excellent recovery, getting up on the thirteenth day, and leaving the hospital on the forty-second day after the operation, quite well, and with the wound healed. (Med. Statistics and Med. Register ii. 41.)

II. CHRONIC APPENDICITIS WITH SUPPURATION. LIMITED INCISION THROUGH ADHESIONS; NO SEARCH FOR THE APPENDIX.

Six cases; all recovered.

A married woman, aged 34, was admitted to the gynecological ward, supposed to have some pelvic inflammation, but was found to have appendicitis. One year previously she had noticed a lump in the right groin, which soon disappeared. She had had pain in this region on and off ever since. Thirty seven days before admission she had been suddenly seized with pain all over the abdomen, followed by tenderness in the right iliac fossa, and the formation of a swelling there. Five days before admission slight shivering occurred. On admission there was distinct swelling in the right iliac fossa. Temperature between 100° and 101°. Ten days later an incision was made through peritoneal adhesions and several ounces of pus let out. The healthy peritoneum was accidentally opened at one spot and immediately sewn up again. The appendix was not seen or felt. The temperature immediately fell to

normal and the patient made an excellent recovery. For about a fortnight there was much discharge of fetid pus. The patient left the hospital forty-six days after the operation, quite well, and with the wound healed. (ii. 1843.)

A married woman, aged 32, was transferred from the gynæcological to a surgical ward on account of chronic appendicitis with abscess. Five years previously she had had an attack of abdominal pain and swelling. Six weeks before admission a similar but more severe attack occurred, lasting three days. Since that time she had had more or less continuous pain in the right iliac fossa. On admission there was a large tender swelling, reaching upwards to the level of the umbilicus and laterally beyond the middle line; it could also be felt by the rectum and by the vagina. An incision, three inches long was made, nearly in the right semi-lunar line, and a local fetid intra-peritoneal abscess opened. The healthy peritoneum was opened at one place, but immediately sewn up again. The abscess cavity was washed out and drained, no search being made for the appendix. The patient made an excellent recovery, leaving the hospital on the forty-ninth day after the operation, and fifty-third after admission, in good health, but with a small sinus not quite healed. (ii. 1864.)

A boy, aged 17, had had in the last five weeks several attacks of abdominal pain, vomiting and constipation, and for three weeks a swelling in the region of the appendix gradually increasing. On admission the swelling extended upwards nearly to the umbilicus. He was kept at rest in bed for twelve days. The abscess had then become very prominent. An incision let out about an ounce of fetid pus. The cavity was partly in and partly behind the anterior abdominal wall, and led directly towards the appendix. It was not further explored. It was drained for fifteen days, and the patient left the hospital forty days after the operation with the wound healed. (i. 720.)

A boy, aged 16, had been in the hospital five months previously, and an abscess of the appendix had been opened. On the day of admission he was suddenly seized with pain in the right iliac fossa and vomiting. A distinct swelling could be felt. Temperature 102.8°, Pulse 90. The patient was not very ill. Three days after admission an incision was made through the old scar, and about an ounce of fetid fluid let out from the old abscess cavity. No search was made for the appendix, but a few days later a portion of the appendix, nearly two inches long, was picked out of the wound, in which it was lying loose. The patient made a good recovery, and left the hospital thirty-five days after the operation, quite well, and with the wound healed. (iii. 3392.)

A labourer, aged 29, was admitted with a considerable very hard swelling in the iliac fossa; he had had one severe attack of acute appendicitis six months previously as well as several other slight attacks. On admission there was no pain and no other acute symptoms. An incision was made down to a mass of adhesions; the healthy peritoneal cavity was opened at one corner of the wound; a second incision was then made into another part of the swelling, but no pus was found anywhere. Nothing was removed; the appendix was not seen. The lower wound was drained, and through it, a few days later, a little pus came away. The patient, who was never seriously ill, made a good recovery, and left the hospital forty-seven days after the operation, and seventy-one after admission. The wounds were quite healed, but there was still a little induration in the iliac fossa. (v. 1536.)

A hawker, aged 35, had never had a previous attack of appendicitis; two months before admission he first noticed pain and swelling in the iliac fossa; he stayed in bed and the swelling disappeared. Six weeks later it reappeared and the skin became red. On admission there was a large abscess, which was immediately opened through the abdominal wall and peritoneal adhesions. The healthy peritoneal cavity was not opened. A pint of foul pus was let out; no search was made for the appendix. The cavity was drained, and the patient left the hospital on the fifty-eighth day, quite well, and with the wound healed. (v. 1758.)

III. CHRONIC RECURRENT APPENDICITIS WITHOUT ABSCESS. FREE INCISION AND REMOVAL OF APPENDIX.

Eight cases : all recovered.

A compositor, aged 28, who during the last eight years had suffered from numerous attacks of appendicitis without suppuration, was admitted in a quiet interval and the appendix was removed ; it was found to be much thickened and distended with mucus. No adhesions, no suppuration, no drainage. The patient made an excellent recovery, and left the hospital on the twenty-first day after the operation. (i. 2633.)

A man, aged 19, had had seven attacks of appendicitis in the last seven months. A few days after the last had subsided the abdomen was opened, numerous adhesions were broken down and the appendix removed. The latter was found to be long and much bound down, but in other respects it was not diseased ; there was no concretion in it nor any suppuration around it. The patient made a good recovery, although convalescence was delayed by a slight attack of pneumonia ; he left the hospital quite well on the thirty-seventh day after the operation. (i. 3600.*)

A boy, aged 9, had had four attacks of appendicitis in the last three months ; a fifth attack occurred soon after admission. About a week after this had subsided, the abdomen was opened and the appendix removed. It was found buried in many adhesions. The patient made an excellent recovery, and was discharged on the thirty-sixth day after the operation. The temperature was normal both before and after operation. (iv. 3428.*)

A boy, aged 11, had had nine attacks in the last three years, the last a month before admission. The appendix was found buried in adhesions and much swollen and thickened ; there was no concretion or perforation. It was removed, and the patient made an excellent recovery, leaving the hospital forty-seven days after the operation. (iv. 3740.*)

A boy, aged 15, had had one attack six months previously. Since that time he had been perfectly well until three weeks before admission, when he began to complain again of pain in the iliac fossa. Two days later he took to bed, with slight vomiting and a swelling in the region of the appendix. He stayed in bed a week and had no pain afterwards ; the swelling gradually diminished. On admission a slight swelling could be felt in the region of the appendix. There was no pain, temperature or other acute symptoms. On the second day after admission the appendix was removed and found to be inflamed and thickened and containing a drop of pus. The patient made an excellent recovery, and left the hospital on the thirtieth day. The temperature was normal throughout. (v. 3248.)

A woman, aged 37, had had several attacks in the last sixteen years. On admission a small slightly tender lump was felt in the region of the appendix. The appendix was removed and found to be slightly thickened ; there was no pus, but there was a small collection of thick caseous material close to the appendix. The patient made a good recovery, and left the hospital on the thirtieth day. (ii. 728.)

A woman, aged 23, had had six attacks in three years, none very severe. On admission there was some tenderness, but no definite swelling in the region of the appendix. An incision was made through the rectus sheath and the appendix found distended with mucus and doubled up by adhesions. The patient made a good recovery, and left the hospital on the twenty-ninth day. (iv. 2064.)

A nurse, aged 25, had had five attacks in two years. There was slight tenderness in the region of the appendix. The latter was removed and found to be thickened and distended with mucus. The patient made a good recovery, and left the hospital on the twenty-fifth day. (iv. 2806.*)

IV. ACUTE APPENDICITIS WITH STRANGULATION OF INTESTINE BY ADHESIONS. FREE INCISION AND REMOVAL OF APPENDIX.

One case ; one death.

A schoolboy, aged 8, was transferred from a medical ward. Eight days previously he had been attacked with abdominal pain, vomiting and diarrhœa. After enemata the bowels were opened and the symptoms subsided somewhat until eight days later, when he became much worse ; the vomiting was then fœcal and the abdomen much distended. The abdomen was opened in the middle line ; numerous old adhesions were found binding down the appendix and enclosing a small collection of dirty pus. The appendix was firmly fixed to the mesentery and was strangulating the last three feet of the ileum. The appendix was removed. The operation was difficult and prolonged on account of hæmorrhage from the adhesions. The patient died before it was completed. The post-mortem showed fœcal extravasation into the peritoneal cavity. (ii. 823.)

V. OLD APPENDICITIS WITH SINUSES. REMOVAL OF THE APPENDIX AND A FOREIGN BODY.—A boy, aged 15, was admitted with a fœcal fistula in the right groin. Two years ago he had been in a medical ward with perityphitis, from which he made a partial recovery, a lump remaining in the region of the cæcum. Seventeen months ago an abscess formed in the same region, and from that time he had had almost continual external suppuration. On admission the boy was thin and ill ; there were numerous sinuses in the right iliac and lumbar regions, discharging pus and fœces. After admission the sinuses began to heal. Four months after admission, the sinuses being still unclosed, they were laid freely open, the appendix tied and removed, and a cavity found communicating directly with the cæcum and containing a piece of rabbit bone, $\frac{3}{4}$ -inch by $\frac{3}{8}$ -inch in size. This was removed and the hole in the cæcum sewn up. The sinuses, however, continued to discharge and the boy died of exhaustion eight months after admission. There was no post-mortem. (iv. 2090.*)

Enterotomy.—A factory hand, aged 30, was admitted with an acute abscess of the abdominal wall in the left iliac region. This was opened and much foul pus evacuated. The wound never healed and sinuses remained, burrowing about among the muscles. Two months and a half after admission the temperature, which had been about 102°, suddenly fell to 97° ; at the same time vomiting and distension of the abdomen set in. A few days later, the symptoms of obstruction being so pronounced and the general condition being too bad to permit of any extensive exploratory operation, a small incision was made into the abdomen and a coil of small intestine opened. Temporary relief followed, but the patient died four days later. The post-mortem showed that the abscess had caused adhesion of small intestine to the abdominal wall ; this in turn had led to strangulation of many feet of small intestine, and of this the patient died. The cause of the original abscess in the abdominal wall could not be ascertained. (v. 714.)

Enterectomy.—The only two cases of enterectomy appear in Table II., under pylorotomy and herniotomy for strangulated femoral hernia ; since, the enterectomy was performed simultaneously with these operations. Both cases are fully described in this Appendix (pp. 200 and 190) under these two headings. (Female ii. 1765 and v. 931.)

Abdominal section with plastic operation for intestinal fistula. A delicate girl, aged 9, had had three years ago an attack of abdominal pain and swelling, for which she was treated at another hospital ; she recovered from this. One year ago similar symptoms recurred and a fœcal fistula formed at the umbilicus and persisted. For this she was admitted, a probe passed downwards and backwards for three inches. The abdomen was opened and a piece of intestine which was adherent to the abdominal wall was carefully separated and drawn out, but the opening into the intestine could not be found ;

the fistula was scraped and a small drainage tube inserted. The patient made a good recovery from the operation, but the fistula continued to discharge intestinal contents, and the patient left the hospital fifty days after the operation with a small fistula still open. (ii. 1813.)

Removal of retro-peritoneal cyst.—A woman, aged 20, was admitted with a globular mass as large as a cricket ball in the region of the left kidney. It had been growing slowly for at least two years. There were no urinary symptoms. The abdomen was opened in the semi-lunar line and the tumour found to be a thick walled cyst, situated in the retro-peritoneal tissue and not connected with the kidney. It contained a semi-solid mass of fibrin, cholesterin and blood pigment. There was no evidence of its being a hydatid. It was clearly not malignant, but otherwise its nature and origin were never clearly ascertained. Microscopic examination of the cyst wall showed only dense fibrous tissue. (v. 2669.)

Removal of extra-uterine gestation.

Three patients recovered and one died.

The latter was a woman, aged 44, who was admitted with the usual symptoms of extra-uterine gestation; shortly after admission symptoms of rupture occurred and the patient became greatly collapsed. Operation was quickly performed, the ruptured tube, a foetus nine centimetres long, and a large quantity of blood clot were removed. The abdomen was washed out. The patient was much collapsed after the operation, and died three days later. There was no post-mortem. (Martha 119.)

The other three cases were :—

A woman, aged 39, was admitted with a considerable pelvic swelling and a history of a normal period two months ago and continuous loss in the last three weeks; about fifteen ounces of old and recent blood clot were removed from the abdomen, but no foetus was actually seen. (Martha 53.)

A woman, aged 33, had had pain and hæmorrhage for three weeks; a ruptured tubal gestation with a softened foetus two inches long was removed; the abdomen was washed out. The patient made a good recovery. (Martha 106.)

A married woman, aged 22, had been suddenly seized seven hours before admission with general abdominal pain, vomiting and collapse. She had had one child three years previously, and menstruation had lately been quite regular, but the last period had lasted three weeks. Nothing could at first be felt in the abdomen, but after a few hours some dulness was detected in the right side of the abdomen, and the uterus was found displaced to the left by a soft pelvic swelling. Fifteen hours after admission the abdomen was opened, a quantity of blood clot removed together with a ruptured Fallopian tube. The sac of the latter was about as large as a walnut. No foetus was actually seen. After the operation the patient was much collapsed, and saline solution was injected partly into a vein, partly into the rectum. The patient made a good recovery, and left the hospital forty-five days later. (Med. Register iii. 137.)

There was also another case (described under ovariectomy) of a woman, aged 24, admitted for a dermoid ovarian cyst; a small unruptured tubal gestation was simultaneously removed from the opposite side. (Martha 44.)

Removal of uterine appendages.

Three cases; all recovered.

A housemaid, aged 37, was admitted with very large fibroids, and suffering much from pain and hæmorrhage. After four months' treatment by other means, both ovaries were removed. The patient rapidly lost her symptoms and left the hospital on the thirty-fifth day after the operation, greatly improved in health, and with the fibroids diminished in size. (iii. 667.)

A woman, aged 30, was admitted with a large pyosalpinx. This was removed entire together with the ovary on that side. The tube contained sixteen ounces of greenish slightly offensive pus. The patient made a good recovery (Martha 16.)

A woman, aged 34, who had had pelvic symptoms for five years, was admitted with a pelvic swelling rising above the brim. Both tubes and ovaries were removed; the right tube was dilated to the size of a hen's egg and contained pus; it burst during removal; the left tube was slightly larger and contained clear fluid. The ovaries were normal. (Martha 67.)

Removal of uterine fibroid.

Three cases; two recovered.

A woman, aged 40, was admitted with a very large cystic fibroid and much ascites. The tumour was removed by abdominal section, and the stump treated extra-peritonically. The patient made a good recovery, and left the hospital on the seventy-first day after the operation. (iv. 356.)

A woman, aged 36, was admitted with a large soft swelling of the left side of the lower part of the abdomen. Abdominal section showed a breaking-down fibroid lying to the left of the uterus. Owing to the patient's feeble state of health it was not considered desirable to attempt its complete removal, so the tumour was simply opened and scraped out, and the edges of the incision then sewn to those of the skin wound. The tumour was drained, and the patient made a good recovery. (Martha 386.)

A woman, aged 42, was admitted with an abdominal tumour, which had been noticed for about two years. There was no menorrhagia, but the bulk of the tumour caused pain and prevented the patient from doing her ordinary work. The abdomen was opened, and a fibroid, as large as a foetal head, was found attached by a narrow pedicle to the uterus, which also contained several small intra-mural fibroids. The pedicle was transfixed and tied, and the tumour removed; the operation lasted half an hour. For two days vomiting was rather troublesome, but otherwise the patient seemed to be doing well for the first eleven days, and complained only of a little pain, due to local suppuration about some stitches. On the eleventh day, however, after an enema, she suddenly complained of great abdominal pain, and rapidly became collapsed. Three and a half hours afterwards the abdomen was re-opened and about two pints of blood removed. The bleeding came from several points, but no ligature could be applied, so the wound was plugged and drained. More blood continued to ooze away, and the patient died eight hours after the operation. The post-mortem showed that the ligature on the pedicle was still holding firmly, and that the hæmorrhage must have come from surrounding parts. (Martha 303.)

Hysterectomy (abdominal) for fibroid.

Five cases; three recoveries.

A married woman, aged 38, was admitted with a large uterine fibroid of six years' duration. The uterus and tumour were removed, and the pedicle treated intra-peritoneally; there was troublesome hæmorrhage at the time of operation, especially from a vessel in the broad ligament. After the operation, which lasted an hour and a quarter, the patient was much collapsed, but she soon rallied; about ten hours after the operation severe recurrent hæmorrhage necessitated re-opening of the abdomen; much blood clot was removed, and some bleeding points secured, but the patient died thirty-six hours after the first operation. The post-mortem showed that the blood had come from a vessel close to the right external iliac artery. (Martha 138.)

A married woman, aged 39, had been ill for about six months, and was admitted with a large pelvic and abdominal tumour extending upwards as

high as the umbilicus. The abdomen was opened, and the pelvis found to contain multiple abscesses; one appeared to be connected with a tube ovarian cyst, the others were in the cellular tissue of the broad ligament. There were numerous adhesions to the intestines, which were separated with great difficulty. The uterus, although not itself diseased, lay in the middle of a suppurating cavity, and was removed together with the appendages. The stump was treated intra-peritoneally. The abdomen was washed out and drained, but the patient died thirty-six hours later. The post-mortem showed pus in various parts of the peritoneum, and an opening from the pelvic cavity led directly into the interior of the rectum. One of the pelvic abscesses had evidently burst into the rectum at some time long prior to the operation. (Martha 72.)

A woman, aged 44, with a large fibroid tumour, extending above the umbilicus and gravid about four months, underwent removal of the uterus, appendages, and tumour. The stump was treated intra-peritoneally. The patient made a good recovery. (Martha 72.)

A woman, aged 33, with a fibroid reaching up to the umbilicus, underwent hysterectomy chiefly on account of the great pain that she was suffering. The stump was treated intra-peritoneally. She made a good recovery. (Martha 195.)

A woman, aged 31, with a similarly large fibroid, also made a good recovery after similar treatment. (Martha 283.)

Cæsarian section.—A woman, aged 37, with a flat rickety pelvis of true conjugate two and a quarter inches, underwent Cæsarian section at full term; both mother and child did well. (Martha 84.)

A woman, aged 30, with a flat rickety pelvis of true conjugate two and a half inches, underwent the same operation at eight and a half months, with a similarly good result. (Martha 28.)

Ovariectomy.

For INNOCENT TUMOUR.—Thirty-eight cases; thirty-one recoveries.

Deaths.—A woman, aged 36, was admitted with a twisted ovarian cyst. Her general condition being bad and the case being an urgent one, ovariectomy was performed shortly after admission. The tumour was found to be a large unilocular cyst, the pedicle of which had undergone one complete rotation. The patient died on the fourth day, and the post-mortem showed that death was due chiefly to chronic bronchitis and a weak heart. The peritoneum and neighbouring parts were all quite healthy. (Martha 54.)

A married woman, aged 32, was admitted for a pelvic tumour and pain in the back; the latter symptom had existed eleven months. The abdomen was opened and an ovarian cyst as large as a cocoon, containing foul pus and gas and communicating with the rectum, was removed after separation from the adherent intestine. The opening into the rectum was large enough to admit a No. 3 catheter. An attempt was made to sew it up with silk sutures, and the abdominal cavity was flushed and drained. The patient's temperature remained subnormal after the operation, and the patient died on the second day. The post-mortem showed that the opening into the rectum had not been completely closed. There was no general peritonitis, but the pelvis contained some blood mixed with faecal matter. (Martha 145.)

A woman, aged 55, admitted with very large broad ligament and dermoid cysts, which were removed with great difficulty on account of extensive adhesions to the intestine and other parts. The operation lasted one and three-quarter hours, and the patient never rallied from it, but died on the following day. The post-mortem showed a flabby fatty heart, much emphysema of the lungs and slight chronic interstitial nephritis. (Martha 177.)

A woman, aged 52, was admitted with a greatly distended and tender abdomen; a large quantity of blood-stained fluid was led out, and a fibrous

partially calcified tumour of the ovary, as large as a cocoanut, was removed; the pedicle was found twisted and there was commencing peritonitis. The patient died two days later of peritonitis. The post-mortem showed nothing else of importance. (Martha 288.)

A single woman, aged 22, was admitted for pain in the lower part of the abdomen; this pain had existed for several months. A small fixed tumour was found in the pelvis; this was removed by abdominal section, and proved to be a suppurating ovarian cyst much fixed by adhesions. The operation was difficult, and lasted an hour and a half. Afterwards the patient was much collapsed; then elevation of temperature, rapidity of pulse, vomiting and distension set in, and she died on the fourth day after the operation. At the post-mortem, it was found that the peritonitis of which the patient died had been caused by the opening up of a small septic sinus that had passed from the ovarian cyst along the side of the rectum, and had probably formerly opened into the rectum; no trace of any such opening could, however, actually be found in the rectum. The opposite ovary was healthy. (Martha 402.)

A woman, aged 58, was admitted very ill with an enormous multilocular ovarian cyst, which at the operation was found to be in places suppurating. The tumour was universally adherent, and the operation, which lasted an hour and a quarter, was very difficult; the operation was followed by much shock, and in spite of transfusion with saline solution she died on the following day. The post-mortem showed pulmonary collapse, chronic interstitial nephritis and some peritonitis. (Martha 421.)

A woman, aged 69, had a fairly large cyst of several months' duration; the operation presented no unusual difficulty; on the second day afterwards the patient began to vomit, and died of peritonitis on the fifth day after the operation. In this case also the post-mortem showed marked chronic interstitial nephritis. (ii. 1835.)

Recoveries.—A woman, aged 24, was admitted with a dermoid cyst of the ovary, which was removed in the ordinary way. A mass as large as a hen's egg was then found in the tube of the opposite side, and after removal this was found to contain a fetus a quarter inch long, the abdomen was washed out, and the patient made an excellent recovery. (Martha 44.)

It seems unnecessary to describe in detail the remaining thirty cases, all of which recovered. In four women, aged 25, 45, 30, and 26, the pedicle was found to be twisted; in the first there was also pregnancy at the third month, with concealed accidental hæmorrhage. (Martha 22, 66, 92, and 349.)

In four cases of women, aged 26, 38, 21, and 22, the tumour removed was a suppurating cyst. (Martha 89, 390, 413, and *Med. Register*, vol. II., 122.)

In one case of a woman, aged 58, the tumour was a solid fibroma of the ovary. (Martha 378.)

The other twenty-one cases were women, aged 43, 29, 25, 30, 42, 30, 34, 40, 33, 42, 29, 30, 36, 60, 47, 23, 57, 30, 16, 55, 37, with unilocular or multilocular cysts. (Martha 21, 93, 112, 127, 146, 227, 272, 314, 352, 358, 368, 384, 412, 414, 424, i. 2329, ii. 1812, iii. 489 and 2727*, iv. 2063, v. 2419.)

For MALIGNANT TUMOUR.—There was only one case, that of a woman, aged 33, from whom double ovarian tumours were removed, and who died on the third day after the operation; the post-mortem showed extreme mitral stenosis, but no secondary growths. (Martha 60.)

Exploratory.

For PUNCTURED WOUND OF THE ABDOMEN.—A boy, aged 12, fell on to a spike, which penetrated the abdomen; the abdomen was opened and the wound explored, and found not to involve any viscus. The patient made a good recovery. (ii. 1609.)

For INTRA-ABDOMINAL HÆMORRHAGE.—These cases have been described fully under removal of uterine fibroid and hysterectomy respectively. (Martha 138 and 303.)

For RUPTURE OF A HYDRONEPHROSIS AND OF THE GALL BLADDER.—A compositor was admitted in a state of collapse, with a history that he had slipped and struck his abdomen against a large stone. The abdomen was much distended, the urine contained no blood. Abdominal section was performed at once, and a large quantity of yellowish red fluid escaped. The cæcum was found bruised, but no other injury could be detected, so the abdomen was closed. For the first few days the patient did well, and the wound healed, then the abdomen began to swell again, and the patient emaciated rapidly. Three weeks after the operation a large fluid swelling was found occupying most of the right side of the abdomen. Several pints of dark chocolate coloured fluid were removed on two occasions by tapping. The patient gradually became more and more drowsy and died on the thirty-ninth day. At the post-mortem, a huge hydronephrotic cyst was found, which had evidently ruptured and collapsed at the time of the accident. There was also a small rent in the gall bladder, which had been adherent to the distended kidney. (iii. 1664.)

For MALIGNANT DISEASE.—Five cases; three recoveries.

A man aged 59, had had for two months pain and emaciation, and for two weeks a tumour in the abdomen. An exploratory laparotomy showed a large mass of cancer in the pylorus, unfit for further operation. The patient recovered from the operation, and left the hospital three weeks later. (i. 499.)

A man, aged 50, who had had for two years epigastric pain, vomiting after meals and emaciation, was admitted with a painful tumour in the epigastrium. An exploratory laparotomy showed a hard nodular mass of carcinoma in the region of the head of the pancreas, unsuitable for further operation. The patient recovered from the operation and left the hospital twenty days later. (i. 2000.)

A lithographic printer, aged 38, was transferred from a medical ward with an abdominal tumour of uncertain nature. He had noticed shortness of breath, emaciation, and the abdominal tumour for about nine months. An exploratory laparotomy showed a hard spherical mass in the liver. It was thought to be malignant and irremovable. The patient recovered from the operation and left the hospital twenty-six days later. (iii. 1460. Med. Statistics and Med. Register iii. 170.)

A traveller, aged 38, had had four years previously an attack of colic lasting four days; otherwise he had been in good health until three and a half months ago, when he became constipated; the constipation became more and more marked, and was attended by occasional severe pain in the back. Three weeks before admission he first noticed a swelling in the hypogastrium. He had no urinary or intestinal symptoms other than constipation. In the last fortnight the abdomen became distended, and the pain in the back was very severe. On admission the patient looked very ill; the abdomen was greatly distended and very tender; a large elastic mass could be felt in the middle and lower part of it; there was orthopnoea. Five days after admission the urine was found for the first time to contain pus, and after this the temperature was frequently 103° or 104°, with occasional slight rigors. At consultations, opinions were divided between a malignant growth and an inflammatory peritoneal collection of fluid. Ten days after admission an exploratory laparotomy revealed a large irremovable mass of new growth. After this the patient continued steadily to go down hill; the wound healed, but the patient gradually sank, and died on the twenty-ninth day after admission. At the post-mortem, a large mass of soft white malignant growth was found in the mesenteric and lumbar glands. The intestines were much involved in the growth, but no other primary growth could be found in them or in any other abdominal viscus. (iii. 3160.)

A woman, aged 55, was admitted with a large abdominal tumour, which had been noticed five months. An exploratory laparotomy showed a huge mass of papillomatous carcinoma of the right ovary, quite irremovable. Some cysts in it were punctured. The patient died three days later, and at the post-mortem was found to have had considerable interstitial nephritis; there were no secondary growths. (Martha 46.)

For UTERINE FIBROID.—A woman, aged 51, was admitted with a large abdominal tumour of six months' duration. The abdomen was opened, the tumour examined with the hand, and some nodules felt which were thought to be malignant; nothing further was done. The patient never rallied from the operation, and died next day. The post-mortem showed that the main tumour was a large uterine fibroid; both ovaries were also enlarged, and the seat of multilocular cystic disease with papillomatous intra-cystic growths. The intestine, which had been adherent to the main tumour, had been torn in detaching it, and had set up fatal peritonitis. (Martha 181.)

For TUBERCULOUS FALLOPIAN TUBES.—A woman, aged 28, was admitted with a pelvic swelling of doubtful nature. Abdominal section revealed a large pelvic abscess. The abdominal wound was then closed, and the abscess opened through the vagina. Suppuration continued, fistulous openings formed between the abscess and the bladder, rectum and cæcum, and the patient finally died some months after the operation. The post-mortem showed tubercle of both lungs and primary tuberculous disease of the Fallopian tubes and ovaries. (Martha 318.)

For OBSCURE SWELLING OF THE LIVER.—A boy, aged 6, had had for eight months pain and swelling in the region of the liver. On admission there was a prominent rounded painless swelling in the epigastrium, evidently in the liver. After an exploratory abdominal section and puncture, it was thought to be of chronic inflammatory nature, apparently gummatous, although it may possibly have been hydatid. (iv. 3275*.)

For SUSPECTED DROPSY OF THE GALL BLADDER.—A woman, aged 41, had had for two years pain in the region of the liver with attacks of nausea, and, as she said, at times a tumour in the region of the gall bladder. It was thought that some enlargement of the gall bladder could be felt. An exploratory laparotomy showed, however, no distension or disease of the gall bladder, and nothing was found to account for the symptoms except some little cirrhosis of the liver. A good recovery followed. (v. 2634.)

For SUSPECTED INTUSSUSCEPTION.—A male infant, aged 1½ years, had been suddenly seized six days previously with violent abdominal pain. An enema brought away some fæces mixed with blood; for three days the child seemed quite well, then pain, diarrhoea, and vomiting set in and continued until admission. On admission the child seemed very ill; under an anæsthetic an indistinct swelling could be felt in the right iliac fossa. Intussusception was suspected, and the abdomen opened. There was no intussusception, and the swelling was found to be a thickened cæcum, apparently tuberculous. The wound was closed, and the child left the hospital ten days later much improved in health. (ii. 1418.)

For SUSPECTED PERFORATION OF TYPHOID ULCER.—A girl, aged 12, who had been admitted to a medical ward at the beginning of the third week of typhoid fever, was suddenly seized a fortnight later, and a week after the temperature had become normal, with intense abdominal pain, vomiting, and a pulse of 140. The abdomen was full, tense and tender. Perforation was diagnosed and the abdomen opened. The ileum cæcum and other abdominal viscera were found normal; the whole colon was, however, much loaded with scybalous masses. The wound was closed. The temperature never rose above normal, and the patient returned convalescent to the medical ward on the twentieth day after the operation. (iv. 16 and Med. Statistics; also Med. Register iv. 29.)

APPENDIX TO SUB-TABLE OF CASES OF ERYSIPELAS, PYÆMIA, &c.

ERYSIPELAS—Cutaneous.

Admissions.

Of twenty-three patients, none died.

Occurring in Hospital.

A man, aged 24, and a woman, aged 65, admitted for a dental abscess and a calculus in the parotid, developed cutaneous erysipelas in the hospital and recovered.

Occurring after Operation.

Two men, aged 19 and 55, after removal of a fibroma of the naso-pharynx and an epithelioma of the tongue respectively, and a woman, aged 53, after a plastic operation for a nasal fistula. All recovered.

Phlegmonous.

Admissions.

Two male and three female patients died.

A male infant, aged 5 weeks, admitted with cellulitis of the scrotum of two days' duration, died on the second day after admission. The post-mortem showed collapse of the lungs and numerous sub-pleural hæmorrhages; most of the scrotum had sloughed. (ii. 3805.)

A male infant, aged 10 months, was admitted with the history that for two days the arm had been red and swollen. The child was very ill with acute cellulitis of the whole arm. Incisions were made into it, but the inflammation was found to have no connection with either bone or joint. The child died on the seventh day after admission. There was no post-mortem. (iii. 1773.)

A woman, aged 51, who had been a heavy drinker, was admitted with cellulitis of the arm of two weeks' duration, following an abrasion of the forearm. On admission she was very ill. Incisions were at once made into the arm and some pus let out. She gradually sank and died next day. The post-mortem showed advanced interstitial nephritis. (iii. 2264.)

A woman, aged 19, admitted very ill with cellulitis of the neck of four days' duration, died two days later. The post-mortem showed extensive mitral disease, diffuse suppuration in all parts of the neck, and commencing affection of the medias tinum. (iii. 116.)

The case of the infant admitted with otitis media and cellulitis of the neck has already been described under the former heading. (iv. 767.)

Occurring in Hospital.

Five men, aged 17, 33, 44, 45 and 53, admitted for lacerated wound of hand, lacerated wound of hand, lacerated wound of scalp, compound fracture of the humerus, and simple fracture of the humerus respectively; all made good recoveries.

Occurring after Operation.

A man, aged 28, after the opening of a very foul abscess connected with the appendix vermiformis, developed cellulitis of the back and died of septi-cæmia. The case is more fully described under operations for appendicitis. (ii. 506.)

PYÆMIA AND SEPTICÆMIA.*Admissions.*

Three male and four female patients were admitted ; of these, four died.

A man, aged 28, with necrosis of the femur of ten years' duration was admitted very ill, with a temperature of 104° ; some pieces of dead bone were removed from the femur, but he died soon afterwards.

A woman, aged 34, admitted with septicæmia due to a small wound of the scalp. The case is described fully under Exploratory Trephining (p. 166.) (i. 1787.)

A girl, aged 15, admitted with acute septicæmia due to necrosis of the femur, died shortly after admission. The post-mortem showed numerous septic infarcts in the lungs. (i. 1952.)

A female child, aged 2½, had had for four days swelling of the eyelids, and for one day swelling of the forearm ; she was admitted very ill with symptoms of septicæmia ; an incision was made at once down to the radius, but the child died a few hours later. The post-mortem showed necrosis of the whole shaft of the radius with pulmonary infarcts. (iv. 1374.)

Of the cases that recovered, two were after typhoid fever and acute necrosis of a phalanx respectively ; suppurative arthritis occurred in both (iv. 415 and i. 1761*) ; the third was a girl, aged 6, with multiple abscesses.

Occurring in Hospital.

There were no cases during the year.

Occurring after Operation.

There were no cases during the year.

DELIRIUM TREMENS.*Admissions.*

There were no cases with actual symptoms of delirium tremens at the time of admission.

Occurring in Hospital.

Ten patients developed the disease soon after admission. Eight of them were admitted for fractures. Only one patient died ; he was a man, aged 48, admitted for a simple fracture of the leg ; he became delirious on the day after admission and died next day. There was no post-mortem. (iii. 934.)

Occurring after Operation.

There were no cases during the year.

TABLE OF AMPUTATIONS (continued).

OPERATIONS.	CASES UNDER TREATMENT.										PERCENTAGE OF DEATHS.										Total Number of Cases, Deaths.	Average Percentage of Deaths.
	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.		
	1	15	13	7	13	14	1	2	...	1	...	13·33	7·69	14·28	7·69	14·2	10·	5·26	50·	100·		
FOR DISEASE—	6	33·33
Hip-Joint	25	1	1	1	2	1	2	...	1	...	13·33	7·69	14·28	7·69	14·2	10·	5·26	50·	100·	152	10·53	
Thigh ...	1	1	1	...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	11	18·18
Knee-Joint	5	7	7	4	6	6	6	...	6	...	...	...	...	...	...	...	...	...	...	67	4·47
Leg ...	11	6	1	6	...	4	6	...	4	...	...	...	...	...	...	...	...	...	...	55	3·63
Ankle-Joint	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Through the Scapula	...	1	3	1	10	10·00	
Shoulder-Joint	1	1	...	5	4	2	1	...	3	26	...	
Arm ...	2	...	2	5	4	4	3	...	4	20	...	
Forearm ...	5	2	4	4	2	...	1	

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TO REGISTER OF POST-MORTEM EXAMINATIONS.

SURGICAL, 1896.

BY THE SURGICAL REGISTRAR.

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