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EDITED BY

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AND

W. J. WALSHAM, F.R.C.S.

VOL. XXXI.

LONDON:
SMITH, ELDER, & CO., 15 WATERLOO PLACE.
1895

Printed by BALLANTYNE, HANSON & CO.
At the Ballantyne Press

IN EXCHANGE.

The Practitioner.

Royal Medical and Chirurgical Society's Transactions, 20 Hanover Square, W.

Guy's Hospital Reports.

St. Thomas's Hospital Reports.

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January 1, 1896.

In Memoriam.

SIR WILLIAM SAVORY, BART., F.R.S.

BY

HOWARD MARSH.

The death of Sir William Savory on March 4, 1895, came as a painful surprise, not only to the profession at large, but also to his intimate friends; for all through life his health had been sound and strong, and the only severe illness from which he had suffered was blood-poisoning from a prick of the finger during an operation in 1867. Up to the commencement of the attack which proved fatal, he had preserved all the vigour and freshness of middle life. His years had scarcely begun to tell upon him, and it seemed probable that he would afford, with Lawrence, Burrows, and the two Pagets, an illustration of the fact that the natural superiority over his fellows which enables a man to reach and hold a foremost place, becomes, later on, apparent in a reserve of energy and staying power, which moves the period of life onward by ten or fifteen years. Unhappily, in his case, however, this anticipation was not destined to be realised. During his fatal illness Sir William was attended by his relative Dr. Pavy and by Dr. Habershon; to the latter the writer is indebted for the following account.

The first symptom complained of was a momentary cardiac oppression and breathlessness, occurring several times in the course of the night, awaking him suddenly from sleep, and producing a condition of nervous apprehension and dread which effectually destroyed his rest. The attack was evidently of the nature of a cardiac neurosis of vaso-motor origin, producing a momentary *angina sine dolore*. Treatment led to some improvement, but the attacks did not entirely subside. Dr. Pavy and Dr.

Habershon were daily at the house, and all went on well until the morning of March 1st, when the temperature, which had previously been normal, was found to be slightly raised. He now complained of feeling very poorly, and there were signs of bronchial catarrh. He was at once kept to his room, and Sister John was summoned from the Hospital to nurse him. His mental depression may be gauged by the remark he made to his daughter-in-law as he was leaving his study, that "he might say good-bye to it, as he should never see it again."

There was no doubt that at this time he was suffering from influenza, which had already attacked several members of his household; but during the following two days the catarrhal symptoms developed but slowly, and the strength was well maintained. There was, however, extreme weakness, especially at night, and very little sleep.

"Once," Dr. Habershon relates, "when I remarked upon this most trying symptom, he said in his old impressive way, 'Ah! Habershon, this restlessness is but the conflict of disease with the constitution; if the constitution gains the mastery, the result is peace; and if the disease conquers, the end is also peace, but it is the peace of death.'"

With this exception, no word of apprehension or anxiety passed his lips. On Sunday afternoon, March 3rd, for the first time, some irregularity of the pulse and signs of heart failure were observed; but with appropriate cardiac stimulation he rallied, and at midnight the pulse was again steady and improved, while the temperature was lower. During the early hours of Monday, March 4th, however, sudden and profound collapse supervened, with extreme cardiac dilatation; all remedies proved of no avail, and in a few hours he passed away, conscious almost to the close.

Sir William Scovell Savory was the son of Mr. William Henry Savory, by his second wife, Mary Webb; the only other child of the marriage being Dr. Charles Savory of Canonbury, who was educated at St. Bartholomew's Hospital, and has long had an extensive practice in the north of London. The two brothers were always warmly attached to each other.

Savory was born within the precincts of the City of London —where his father was engaged in business, and was churchwarden of the parish of St. Mary Athill—on November 30, 1826.

Entering at St. Bartholomew's Hospital in 1844, he passed the College of Surgeons in 1847, and was appointed temporary House-Surgeon to Mr. Stanley in 1848. Savory rapidly became the most distinguished student of his time. He gained all the

chief prizes in the Medical School, and at the University of London in 1848 won the scholarship and gold medal in Physiology and Comparative Anatomy, the gold medal in Surgery, the gold medal in Midwifery, and honours in Medicine.

With such a record, he was early selected as a member of the teaching staff as Demonstrator of Anatomy. In 1850 he was appointed Medical Tutor, and in 1852 he took the Fellowship of the College of Surgeons. In 1859 he became Lecturer on General Anatomy and Physiology at the Hospital, in succession to Paget, who resigned this chair when he followed Lawrence as Lecturer on Surgery.

In those days the Curatorship of the Museum was conjoined with the Lecturership on General Anatomy and Physiology. While he was Curator, Savory earnestly devoted himself to pathology and morbid anatomy. Much of his work was original, and was the outcome of his researches in the department of physiology, in which he was at that time chiefly engaged. But he was a good Curator in another sense. He was enthusiastic in his admiration of the work of such pioneers as Pott, Abernethy, Stanley, and Paget, who by their sagacity, watchfulness, and untiring industry had laid the foundation for a great Pathological Museum, which it was, as he felt, the manifest duty of their successor to cultivate and develop to the utmost of his power. He worthily followed up their labours, and while he was in charge, the collection was maintained in excellent order and enriched by the addition of a large number of valuable specimens.

Having contributed papers to the Philosophical Transactions on "The Structure and Connexions of the Valves of the Human Heart," on "The Development of Striated Muscular Fibre in Mammalia," and on "The Relative Temperature of Arterial and Venous Blood," he was elected a Fellow of the Royal Society in 1858. He continued to lecture on physiology until 1869, when Paget resigned the Surgical Lecturership; he was then appointed to this chair conjointly with Coote, and later with Callender. On Callender's death in 1879, Savory became sole Lecturer, and so remained till he resigned in 1889. He was thus a Lecturer on one or other of two of the most important subjects in the School for about thirty years.

In 1861 Mr. Lloyd resigned the office of Surgeon, and Mr. Wormald succeeded him. To fill the vacancy thus created, Savory was appointed Assistant-Surgeon, and in 1867, on the resignation of Mr. Wormald, full Surgeon. In 1891, having reached the age limit of sixty-five, he retired from the active

service of the Hospital, and was appointed Honorary Consulting Surgeon, and chosen a Governor. For many years he was Surgeon to Christ's Hospital.

As Surgeon to St. Bartholomew's Hospital and as a member of the Medical School, Savory occupied a position which few are competent to hold. He inspired, even at first sight, the conviction that he was no ordinary man. In personal appearance he was strikingly handsome and fine-looking. Somewhat over five feet ten inches in height, he had a well-developed chest and broad shoulders. Thus his figure was cast in a large mould; but the impression it conveyed was not that of great physical strength —for his muscular development was comparatively slight, and his hands, though large, were somewhat thin and soft—but rather of a just correspondence between the bodily type and the man himself. His forehead was large, high, and finely proportioned; and the writer has heard him say, with quiet complacency, that Lawrence and he wore hats of exactly the same size. His eye was pale blue, inclining to be gray. Its general expression was that of calm intelligence, but it was singularly expressive, and its range of expression was remarkable. It is a truism to say that the eye often discloses the whole man, and that the more remarkable the man, the more telling is the eye. Savory's eye was clear, steady, and alert; it seemed to give a pledge more binding than any words; it could be eloquent in thanks, it could convey generous approval. These were its quiet moments. But in an instant it became all aglow, and expressive, as the occasion ruled, of keen attention, intense amusement, or blank incredulity; or it would cloud over and darken, and launch a sudden ultimatum. Steele, in the *Spectator*, tells us that he has seen an eyebrow call a man a scoundrel. Savory's eye, at all events till years brought larger tolerance and restraint, not only pronounced sentence, but it passed on to slay the enemy where he stood.

The stamp of man was clearly apparent in the modelling of the lower jaw. This and the mouth gave no suggestion of coarseness or sensuality, they indicated strength, but strength on the intellectual side. The muscles of his clean-shaven face were all strongly marked, and many a student who could stand a good deal has felt very weak about the knees, mentally as well as physically, when he has found Savory's eye upon him, and has seen his masseters in a condition of rhythmic contraction.

He was never a laborious clinical teacher. Always able to acquire knowledge very easily, he was easily bored. A succession every three months of a fresh group of Dressers—of men

who, however intelligent, cultured, earnest, able, and pleasant as junior colleagues, were yet merely beginners — kept him down to rudiments and to a routine for which he had little taste.

But a student who was, so to say, out of his teens, and who could observe and weigh for himself, learnt much from following Savory's practice. The senior student was attracted by his striking general characteristics,—his complete straightforwardness and transparent honesty of word and purpose, and his high tone in regard to every aspect of professional conduct. As to any spirit of trade or any unworthy trick or device in the pursuit of professional success, these things, which are plain enough to lookers-on, were in him conspicuous by their absence, and their absence is always attractive. His bearing in the wards, while it was calculated to strike awe into the mind of a new Dresser, became, to one who had gained a larger experience of the attitude and relations of the staff to their junior friends, much less formidable—in fact, merely a pleasant stimulus. All this led a senior man on to observe Savory's intellectual force, his familiar knowledge of physiology in its application to surgery, his intimate acquaintance with pathology and with the classical specimens contained in the Museum of the College of Surgeons and of St. Bartholomew's Hospital, and his enthusiasm for the teaching and practice of such leaders as Brodie and Lawrence, whose doctrines he regarded, and constantly spoke of, as the principles of surgery.

The result was that, if there were certain things which he missed, such as the early recognition and adoption of new views and new lines of practice, and perhaps some want of familiarity with methods and proceedings which, though they were of minor importance, were yet of real value, the senior man found himself amply repaid for any time that he spent with Sir William Savory.

In the management of individual cases, Savory's sound knowledge and sagacity were always conspicuous. In diagnosis he was at his best in dealing with tumours, and diseases of the bones; but in all cases alike the conclusion at which he arrived was the outcome of a robust intelligence, and a large and well-digested experience, was clear and definite, and was expressed forcibly and concisely. In cases involving an appeal to the broad principles of surgery, and requiring hard common-sense and a well-balanced judgment, his opinion was always weighty and instructive, and, as a very general rule, as the result showed, perfectly correct.

As an operator he was thoroughly able and competent, but

he was not, nor ever cared to be regarded as a brilliant operator. Indeed, a brilliant operator was in his eyes a doubtful figure in surgery. He recognised and set a high value on the dexterity of which, for example, Fergusson was so complete a master, and which followed and was strictly subservient to a process of reasoning which took into account and placed in the order of their true value the different elements of the case in hand. But for the brilliancy that impressed lookers-on who were not advanced enough to be good judges, and that was either crude audacity or mere manual swagger, he always had a feeling of strong disapproval, which he was at no pains to conceal. This attitude disclosed two of Savory's strongest characteristics—the deep and unqualified respect that he entertained for the science and art of surgery, and the very thinly-veiled contempt which he felt for everything that was shallow or fictitious.

He was, to a great extent, ambidextrous, but he always operated with his left hand. In his manipulation there was nothing that was finical, hesitating, or confused; and his old House-Surgeons and Dressers will recollect how well he tied the femoral or performed Syme's amputation.

As a member of the Medical School, Savory always exerted a predominant and valuable influence. None could doubt that he had the best interests concerned completely at heart. His loyalty was unsullied by any detracting quality; his vision was clear; he was perfectly familiar with the constitutional history of the Hospital and the School; his memory was excellent, and he was earnest, grave, and dignified. Thus affairs were maintained at a high level while they were in his hands. It must, however, be allowed that his opinions were so strong, and that he maintained them with so much vigour and dialectical ability, that it was very difficult to move him. A great deal depended on the manner in which, or what is nearly equivalent, on the individual by whom he was approached. Early in his career there were some with whom he instinctively assumed a warlike attitude, and whom he was not prepared to pledge in the milk of human kindness. With such the sun went in behind the gathering clouds, the air was chill, and the wind rose in ominous gusts. It was a foregone conclusion how the encounter would end; and there was an equal certainty that no wish would be expressed for a second interview upon the same terms.

But there were many for whom Savory entertained a sentiment of warm and generous friendship, and with whom he always worked cordially and easily. Strong as his convictions were, he made it a constant rule to yield at last to the majority.

He stated his opinions, and gave his reasons for them; but when he had done thus much, and had made it perfectly clear that—

> "A man convinced against his will,
> Is of the same opinion still,"

he left the matter to the general voice. In this way many things which he would have preferred to leave undisturbed were gradually changed.

The following incident appears worthy of being recorded as an indication of his qualities as a colleague. When one who was at the time a junior member of the staff became his Assistant-Surgeon, Savory said, when chatting over the work in the wards, "What about the beds?"—meaning how many would he like to make use of. On receiving the reply, "Oh, I think that must be from you," he remarked, "Well, take what you like, and if that is not enough, let us talk the matter over again." This arrangement, which indicated an official liberality which juniors all the world over will appreciate, worked smoothly and without interruption until the connection was severed by changes in the staff.

All St. Bartholomew's men will remember Savory's renown as a lecturer. When it is said that such an one is a good lecturer, in whatever department of teaching, it is necessary to inquire in what sense the phrase is used. Many men are good lecturers who have no claim to be called good speakers; for in lecturing there is the material, and there is the medium by which the material is conveyed, and these two things are different. A poor or even a bad speaker may be a very good lecturer, for his material may be of the highest value, although the best that he can do is to convey it in a hesitating manner and in broken and stilted sentences. Another, although he is a fluent talker, is little better than sounding brass. The material is not there. Either his knowledge is second-hand—much of it is plainly stamped "made in Germany"—or he is without the full measure of long and varied personal experience which is necessary to render him a master of his subject. But some admirable Lecturers, who are also excellent speakers, think nothing of style, but make it their only aim to convey the best they know of the subject before them. The writer well remembers the lectures of Sir William Jenner. They were entirely devoid of style, but they always created a strong impression. They were rich in material, and were delivered in plain language, in short, telling sentences, while the Lecturer moved about on a platform in front of his audience, generally holding a short pointer

which he handled in such a way as to suggest some danger to the head of any member of the class who failed to pay attention. His manner was energetic, sometimes vehement, and he seemed absorbed in the business of stating what he had to say so that it should never be forgotten. He appeared, indeed, to have his eye on the future, and to dread that, on meeting him in consultation, he might find that one of his pupils had forgotten to look for sugar, or to examine the gums for evidence of lead-poisoning.

Humphry of Cambridge, when he lectured on anatomy, had a manner of his own, in which he left style to take care of itself. Sitting edgeways on a high stool, and handling the keys in his pocket, he placed his material, often quite original, and always suggestive and interesting, before his class in attractive and well chosen but conversational language, while at the same time he conveyed the idea that if men did not listen, and listen with intelligence, when they met the Lecturer in the dissecting-room, or, later on, in the wards of Addenbrooke's Hospital, they must expect a very uncomfortable quarter of an hour.

In Savory's lectures style was conspicuous. He was, in fact, a born orator, and each lecture was an oration. His appearance, his bearing, and his voice were all entirely in his favour. He had an ample command of pure and vigorous English, there was nothing prolix or obscure, and, when he chose, he could make effective use of wit, irony, or satire. With a correct sense of proportion, he addressed himself to the essential parts and main principles of his subject, and never descended to details which he had no time to elaborate, and which would have obscured the broader outlines which it was his object to present. Conscious of his gifts as a speaker, he had carefully studied the best public speakers of the day. When a young man he often heard the leaders of Parliament, visited the Law Courts, and attended churches wherever celebrated preachers were to be found. Students heard his lectures with admiration, and it is a remarkable testimony to the effect they produced, that a pathologist who is one of the ablest thinkers and busiest workers in London, and himself an excellent lecturer, attended his classes for one if not two winter sessions.

From one point of view, however, Savory's lectures, as well as his clinical work, were open to criticism. He looked coldly upon change, and was not at all times quite sufficiently ready to accept modern advances. By this it is not meant that he disliked a thing merely because it was new. His intelligence would have revolted from any such foolish prejudice.

But at the dawn of aseptic surgery, some twenty-five years ago, he was, like many others of that time, placed in a position of great difficulty. He was given to understand that old things were passing away and that all things were becoming new. He was in a strong current, which was bearing him away in an entirely novel direction, and his difficulty was increased by the circumstance that the new order of things, whatever elements of truth it might ultimately prove to contain, appeared to him to be mixed up with many inconsistencies, and absurdities so palpable that they must make even the angels weep. Being himself only human, they made him chuckle with the keenest enjoyment.

Revolutionary periods, however, are times rather of enthusiasm and impulse than of cautious and mature judgment, and it must be allowed that Savory's attitude was too much one of immediate recoil. But having said thus much, it is necessary at once to indicate the ground on which he really stood. With the objects of the new School of Surgery he was entirely in sympathy; indeed, they were those which he had always endeavoured to obtain, and which, considering the times, he had in a large measure secured. But he was convinced that some of the details of practice which he saw adopted were open to serious objection. Time has shown that he was right, and the methods which he criticised have long since been superseded. Nor need this be a matter of surprise. In all new departures the original methods employed are apt to be crude and defective. As the German proverb says, All beginnings are difficult—"Aller Anfang ist schwer."

Savory's judgment erred in this: he did not at once apprehend the fact that behind all these early attempts and tentative proceedings—the sprays and the antiseptic putties—there lay a principle that was to revolutionize surgery and enormously extend its field, and make surgery, in a manner hitherto undreamt of, auxiliary to the practice of medicine.

Sir William Savory was elected a member of the Council of the Royal College of Surgeons in 1877. Here he was to play a leading part for many years to come. His intellectual force, his high character, his powers of exposition and of argument, and his power also to make an unwelcome adversary smart, soon placed him, by common consent, in a position of weight and authority. The present article offers no fitting occasion for a discussion of the politics of the College. Yet some reference to the subject is unavoidable. The history of many corporate bodies is, in one respect, very much the same. The bulk of the executive members usually lean in the direction of maintaining

the *status quo*. They are conscious that their duties are discharged with full integrity and diligence, and with an amount of labour which often meets with but scanty recognition. They feel themselves the custodians of interests which they must not lightly impair, and, as a most material point, they are in possession of special information which largely modifies a *prima facie* view of the subjects which present themselves for discussion. In these circumstances they are likely, when crucial or even material changes are proposed, to err, if at all, on the side of caution and delay. They are at least prompted to wait until it becomes clear that the alterations urged upon them are endorsed by the will of the majority. On the other hand, the desire for change is always prone to assert itself in the ranks of a constituency. New-comers regard things in a new light. The spirit of democracy—the term is here used in no adverse sense—is ever a rising tide. In its moderate flow it is the outcome and expression of sound growth and normal progress. In the seventies and subsequently, some changes proposed by the constituency were readily adopted by the Council, while some emanated from the Council itself. And both alike marked a healthy development, the establishment of just claims, and the recognition of entirely legitimate aspirations. During this time, however, various questions were raised which led to wide differences of opinion, and to vehement, and even, in some quarters, acrimonious debates.

In such disturbed periods, it was highly necessary that the action of the Council should be characterised by sound judgment. Under these circumstances Savory exercised a steadying influence, the value of which it would be difficult to exaggerate. He was undoubtedly a strong conservative. By some of his opponents he was regarded not only as firm, but as obstinate. Yet the power to say "No" is a very useful gift. It has a strong effect in defining the situation and bringing a discussion to its ultimate terms. It often averts a false step which would be difficult to retrace.

Doubtless there are many, whose path it has crossed, who regard obstinacy as altogether blameworthy. To such the following words of Burke, which have been brought to the notice of the writer by Dr. Norman Moore, may be commended. The quotation is a part of the famous passage on Charles Townshend. "Obstinacy, sir, is certainly a great vice, and in the changeful state of political affairs it is frequently the cause of great mischief. It happens, however, very unfortunately, that almost the whole line of the great and masculine virtues, constancy, gravity, magnanimity, fortitude, fidelity, and firmness, are

closely allied to this disagreeable quality of which you have so just an abhorrence, and in their excess all these virtues very easily fall into it."

In Savory's case those who differed from him could not fail to be impressed with his grasp of the various subjects in dispute, his accurate knowledge, and the statesmanship—the word is not too strong—which he always displayed. His strongest opponents always spoke of him as one whom they could cordially respect.

The general esteem in which he was held, and the position he occupied in the eyes of his colleagues on the Council, were indicated by the remarkable fact that, having held the office of President in 1885, he was re-elected, not only once, but on three successive occasions, so that he occupied the presidential chair for an uninterrupted period of four years, an event entirely unprecedented in the history of the College.

The subjects which chiefly occupied his attention, and in the development of which his influence was always predominant, were the union with the College of Physicians, and the erection of the Examination Hall; the Supplemental Charter of 1888; the extension of the curriculum to five years; and the scheme for a Teaching University for London.

He was Hunterian Professor of Comparative Anatomy and Physiology in 1859–60 and 1860–61; Bradshaw Lecturer in 1884 and Hunterian Orator in 1887. This oration given, as his custom was, without a note, was pronounced by all who heard it admirable alike in the material it embodied, the purity of its style, and the skill and grace with which it was delivered.

In 1893 he became one of the Trustees of the Hunterian Collection, and so remained up till the period of his death. He was a member of the Board of Examiners in Anatomy and Physiology from its establishment in 1875 to 1878, and a member of the Court of Examiners from 1870 to 1885.

Savory was not a voluminous writer. Nothing would have induced him to write in order to obtain notoriety or secure professional success. The knowledge he had to communicate was conveyed chiefly in the form of lectures, and these lectures were never published. He contributed papers, however, from time to time to the Transactions of the Royal Medical and Chirurgical Society, the St. Bartholomew's Hospital Reports, and the medical journals.

But there were special occasions on which he gave public lectures or addresses which showed his real strength. In 1863 he delivered a course of four lectures on "Life and Death" at the Royal Institution; and he twice gave the introductory

lecture at the opening of the winter session at St. Bartholomew's Hospital.

On these and similar occasions Savory was at his best, and showed himself as a man not only of great intellectual power, but also of high convictions and aspirations, with a philosophical mind, and an earnest devotion to the claims of duty.

His address on "Surgery" at the meeting of the British Medical Association in Cork in 1879 might well be compared with the best efforts of the great leaders of the Bar when some case upon which all eyes are fixed is being tried. It comprised and illustrated all the elements of the highest forms of forensic eloquence, and showed that, had Savory adopted a parliamentary or a legal career, he must have held foremost rank amongst the celebrated debaters or advocates of his day. It also showed how high-minded and just a man he was. The address was a direct and uncompromising attack on some of the principles, and on the practice of Professor Lister; but from its opening to its close he never for a moment confused the scientific question under debate with the personality of his opponent. There were no reflections made, and no aspersions cast. He spoke as if he were sure his adversary was completely wrong, and he did his best to show that this was the case; but every word he uttered was the word of an honourable man addressed to an honourable and distinguished opponent. The appended extract will serve not only to demonstrate Savory's position on this occasion: it will serve also as a model of the spirit in which controversies on scientific subjects ought to be conducted. *O si sic omnes!*

"One word further. I have spoken without reserve—as I take it I was bound to do if I spoke at all—of this now famous plan of treatment. By this I think I have shown the truest respect for the author of it. If I esteemed the practice of Professor Lister less, it would have been easy to offer him the homage of flattery, to congratulate him on his renown. It appears to me that I have evinced more regard for his authority and placed a higher estimate on his work by studying to the best of my ability the method he has introduced, by not expressing an opinion adverse to it in public, or from a position of responsibility such as this, until my conviction had grown strong and clear; and then I think I best mark my appreciation of his purpose by thus speaking out freely and fully. And though I am thus—not on principle, but in practice—opposed to him, and many others whose ability and knowledge I admire and respect, I know very well that on a yet greater issue—the advance of surgery—we are heartily

together; and with unfeigned diffidence of my own judgment, I have yet further consolation in the assurance that, if I am in error, these words of mine, even from this place, will prove no serious obstacle to the progress of truth."

In his introductory address in October 1860 the following occurs. It is quoted here as an illustration, taken at random, of his views and teaching, and of the form in which his teaching was conveyed:—

"Gentlemen, life is before you. If Anticipation, the enchantress of youth, could by the touch of her bewitching wand disclose to your view the future of your lives—could you, as you are, see what you might become, there need be no misgiving of the course you would pursue. But what is now all mist and shadow, Time, the great magician, will soon, too soon, reveal; so soon, that before this session shall have passed, it may not be impossible to discern the destiny of many amongst you. Your choice is still free, but you have no hours to spare. Though that alone were not inglorious, there are far higher motives to industry than mere worldly advancement Industry will ensure knowledge, and knowledge is excellent for its own sake. The knowledge that you will acquire is most excellent and most useful. Most useful to yourselves, for it will, if rightly employed, enlarge every faculty, exalt the understanding, and ennoble your whole mind. Nay, more, the study of the last of Nature's works should teach the truest wisdom, for this transient structure tells, in every change it undergoes, of a life Elysian for the spirit it enshrines. And lastly, though not least, most useful to others, for the aim and end of your work is to do good: 'to give a true account of your gift of reason for the benefit and use of man.'"

Before this retrospect is brought to a close, some allusion must be made to Savory's life in his own household and among his personal friends, for often those who were brought into contact with him only in the routine of official life, and on occasions of discussion or controversy, were led into a misconception as to his real character and disposition. To many he seemed cold, distant, and unsympathetic; rather swayed by ready dislikes, and a too supercilious estimate of other men's powers and acquirements, than genial, tolerant, and ready to offer the right hand of fellowship. But this was to a great extent a mistaken estimate. Although only those who knew him well were aware of it, Savory was highly strung, and acutely, almost painfully, sensitive. Whatever he felt he felt intensely. He was warmly attached to his friends, and much concerned if they were anxious or distressed. It is generally known how much

he was shaken by the death of his old and intimate friend, Mr. Hulke, for whose character, ability, and accomplishments he had a genuine admiration. Any illness in his own family threw him into a panic, and he became depressed and miserable. On the other hand, no one enjoyed quiet fun, pleasant banter, or even frolic, more than he did. He could be intensely amused, and, though he usually made a strong, and more or less successful attempt to suppress the physical side of laughter, it sometimes looked as if the effort might be followed by serious consequences. The writer remembers him at one of the Inter-Hospital football matches, completely absorbed, pale with excitement, and apparently scarcely able to resist the impulse of rushing into the thick of the contest.

No one was a better judge of what was generous, single-hearted, and true; no one recoiled more instinctively from what was base, trumpery, or cunning; no one saw more clearly what are the things that elevate, and what are those which degrade a man or a profession. To the former he extended a hearty approbation; they satisfied him, and gave him positive happiness. From the latter he shrank with profound dislike. Any one of whom all this can be justly said must be a man, as assuredly Savory was, of elevated and fine character; but at the same time it may be granted that things which others, who were equally right-minded but less acutely sensitive, could take in good part, and pass by as unimportant, sometimes roused him to protest and opposition, and thus when his opponents thought him hard and uncompromising, his attitude was due merely to the fact that, unhappily, his fur had been stroked the wrong way.

Savory's generosity and warmth of friendship for those with whom he was intimately associated were shown by the relations which existed between himself and every one of the long list of his House-Surgeons. It would be hard to name any appointment, open to men of two or three and twenty, the duties of which are more highly responsible, arduous, and, on occasions, difficult, than are those of the House-Surgeons of the large London hospitals. The best may find himself, either because he has been for a moment off his guard, or because circumstances have conspired to entrap him, placed in a very embarrassing position, and exposed to blame which he by no means deserves. Savory always appreciated this. His attitude towards his House-Surgeons was one of magnanimous loyalty and hearty support. He evidently felt that his junior colleague was, so to say, *ex officio* entitled to special consideration. This attitude won for him the warm thanks and devotion of all his

House-Surgeons, and made them proud to have held office under him. Out of these sentiments there arose in 1888 an event which gave him the keenest gratification. His House-Surgeons, to the number of thirty-five, subscribed for his bust, and this was produced in marble by Mr. Hope-Pinker. It was a remarkable success, and was exhibited at the Royal Academy in 1890, having been already, in 1889, presented to Savory by his first House-Surgeon, Macready, at the residence of Chune Fletcher, in the Charter-house, in the presence of almost all the subscribers. It has been decided by the Council to place a replica of this bust by Mr. Hope-Pinker in the Royal College of Surgeons, where it will have for its companions the busts of Pott, Abernethy, Lawrence, and Paget.

It was a matter of course that the feelings entertained on all sides for one who had rendered such great services to the Hospital and School should find a permanent expression and record, and Savory, on his retirement from the Hospital in 1891, was asked by his friends and former pupils to sit for his portrait. This was painted by Mr. Walter Ouless, R.A., and, after exhibition in the Royal Academy in 1892, was presented by Sir James Paget, in the name of the subscribers, to the Governors, and placed in the great hall of the Hospital.

In 1887 Savory became Surgeon Extraordinary to the Queen, and in 1890 her Majesty conferred upon him the honour of a baronetcy.

The following is from the pen of Mr. Oliver Pemberton, an excellent judge of men and manners, who knew Savory intimately in his early days, and who throughout a long life was one of his intimate and most highly valued friends.

"It was at the commencement of the winter session of October 1846 that I first saw William Savory—the place the dissecting-room of St. Bartholomew's—the time soon after nine in the morning, when the early refreshment of Paget's lecture at eight had ended, and his audience dispersing, broke the deep silence that had held them listening spell-bound to the words of the master of surgical pathology during the previous hour.

"The envied possessors of a 'head and neck'—absolutely unlearned in the first steps of dissection—were gazing helpless at their property. The scalp, removed in pieces, bore testimony to their difficulties and struggles.

"What next was to be done?

"Happily their tools looked handy, and, as I stood behind them, it was not without misgivings, being a stranger, that I proffered assistance.

"Pleasingly accepted, the work made way, smoothed by an

interchange of those occasional and original reflections peculiar to the men that hang about a dissecting-table and never dissect.

"The last touch of saw and scalpel had been made, and I was laying them down, when I felt a firm hold of my shoulder. I turned suddenly as I caught the clear tones of a voice that said, 'This is not the first time, sir, let me tell you, you've managed this business. I've been watching you.'

"I found afterwards the speaker was Savory, and the next day, without further preface, began a friendship which death only closed at the end of nigh fifty years.

"In his student days Savory displayed clearly the chief features of character, conduct, as well as language, that marked him, well nigh unchanged throughout life. At this time he was twenty and I a year older.

"These comprised extreme accuracy in all things he undertook; as applied to memory an infallibility. The fellow-student had only to ask regarding a minute point in anatomy or physiology to at once receive the information; but it would be given with the invariable smile—the kindly correcting light of surprise in eye and turn in lips that said more plainly than words, 'You ought to know this without my help. Why do I know?'

"Herein was evident the existence with him of an intense satisfaction—a supreme pride that moved his entire nature, producing, as it were, a thrill of joy that he had worked, and knew that which others had failed to grasp.

"This was not ill-natured pride, but rather that self-congratulation that justly is the sweetest reward of mental culture. Here was ever Savory's triumph. He enjoyed the victory he himself had gained over knowledge, but he never failed to convey the impression, whenever he solved a difficulty, that the solution held, in addition, a kindly rebuke.

"I think, imperfectly as this peculiarity is set down, that it remained unaltered. In hospital work, in scientific meetings, in professional and social intercourse with his most intimate friends, it ever existed. In the every-day work of the world it never seemed to me that he felt any sense of inferiority; there was a loftiness of nature about him—a high-minded sense of what was fitting, that led him to regard the arts of deceit, with all its cunning devices—to gratify personal ambition—with a withering scorn that meant degradation in the mere knowledge of its existence. Yet with all this there was not any assertion of superiority—no conceit.

"No one can have been familiar with Savory's manner without becoming aware in numberless things, said and done, that

there was evident in him a supreme consciousness of power. From this arose the earnest desire to acquire that which, to my mind, constitutes in its attainment the summit of worldly hopes—the admiration of one's fellows—the hearing the 'breath of human praise.' His devotion to this object, the legitimate expectation of culture and personal honour, never ceased, and the reward came.

"This came in the shape of an acknowledgment, never cancelled, not even challenged, that he possessed the gift of speech, the faculty of lucid statement, at once brief yet complete. It was with him from his earliest days, and it never left him. As time went on the endowment grew, so that, as it grew, it became refined and polished, compelling, on supreme occasions, acclamation, again and again maintained, in appreciation of the speaker. Who will fail to agree in this who listened to Savory's address at Cork before the British Medical Association, or the Hunterian oration at the College of Surgeons? Faultless in elocution, in language, in expression, each oration for an hour riveted the attention of audiences skilled for criticism and not averse for censure.

"His choice of words always struck me as vividly realising a purity of style attained but seldom, save by those with whom public speaking constituted the main avocation. Doubtless he took his model, and for this he had only to look within the area of his own calling; for from his earliest days as a student he had Lawrence—at the college, Joseph Henry Green—and amongst us, now eloquent as at the beginning, the Nestor of the profession, Sir James Paget. With Savory the courtesies of everyday life were never absent, and though his intercourse with the world was neither infrequent nor unsympathetic, his friendships were few in number. Those who knew the inner life—the home surroundings, the occupations and thoughts apart from the profession—recognised both the firmness and the constancy of his friendship. It was never capricious. He could find fault, and no one who knew him would deny his capacity for disagreement; but his manner of differing, from its convincing strength of utterance and truth, served only in the end to draw closer the bonds of attachment.

"There was one that I too most dearly respected, and knew to be a friend, whom Savory regarded with the closest affection—I mean John Whitaker Hulke. By the sudden and untimely death of Hulke—one of the most learned and accomplished of men—Savory was deeply affected. He wrote me a few days afterwards a most touching reference to Hulke's integrity and personal honour, and to the irreparable loss

that he had sustained by his death. Within a week, Savory himself was stricken with fatal illness, and soon followed his friend to the grave.

"It was impossible to look on Savory without being struck by his intellectual grace. In gesture, in movement, this was especially remarkable, whilst the sparkle of eye and play of mouth gave evidence of his keen enjoyment of those flashes of wit which he regarded as giving a new life to our thoughts and understanding.

"Words once spoken by a great jurist in reference to the premature death of a fellow-worker commend themselves to my judgment as applicable in all ways to William Scovell Savory:—

> 'Pulcher, pulcher et acer
> Et nobilis et generosus.'"

In Memoriam.

MR. MARK MORRIS, THE STEWARD.

There is probably not a Bartholomew's man now living who did not know the Steward, and to whom the name will not recall one of the most familiar faces in the Hospital.

The Steward's office was the place of call for every old student who paid a visit to the old haunts, and the Steward was the attraction. Half-an-hour's chat with him over old times, when he was at leisure and in the humour, was a pleasure to be long remembered.

The following sketch of the old Steward is drawn by the friendly hand of one whose memory goes back to the days when even Mark Morris was not yet an officer of the Hospital.

Mark Morris, the Steward of St. Bartholomew's Hospital, has passed away, leaving a bald place in the Hospital head-piece, a blank which is and will be felt. He was an unusual man, without corners and without eccentricity, but distinctly special and sterling. He was unaffectedly simple and simply modest. It is dangerous to describe him fully, lest his real merit be drowned in seeming exaggeration.

Many men have equal devotion to duty,—many the same amount of good temper and amiability,—many have equal capacity for doing what they undertake; but those who knew Mark Morris will allow that it is rare indeed to find in one person such strict discipline so tenderly enforced, such unsparing attention to duty combined with sympathetic tolerance of fatigue in others, so that he seemed to love his neighbour better than himself.

He has passed away so closely upon the issue of this volume

that there has been no time for the selection of a fitting biographer, nor for such an one, if he had been found, to gather the characteristic incidents of his career. To one who knew him first as the Museum-keeper and the careful putter-up of pathological specimens between 1844 and 1850 (he began some years earlier), he was the same steady devotee to the business in hand as he ever showed himself afterwards, and the same unruffleable rebutter of students' chaff and raillery as he always was, not only never taking umbrage, but never believing that offence could be meant, and always meeting playfulness in a pure spirit. His was the amiability of courage. He was manly. There was not a shadow of subterfuge in his composition.

While he was Museum-keeper the superintendent of the "Surgery" (Mr. Tracy, who was also the dentist to the Hospital) resigned. Mark Morris was appointed in his stead. This was in 1850. The House-Surgeons (there were only three in those days) were the prominent authorities at the Surgery, while the Apothecary, who was the Physician's resident representative, ruled in matters medical at the Entrance Hall. How he addressed himself to Mr. Wood cannot now be told, but his way of approaching the House-Surgeons was characteristic. He had known them as boyish students in the Museum, and he found them in a sense his chiefs, and so he treated them. "You'll try and make it easy for me at first, for everything depends on a good start," said he, with all modesty. There was not, however, any need for consideration. It was very soon apparent where consideration would be most wanted. He showed it everywhere and to everybody, with great advantage to the management of that important position. It was his conduct of this position that pointed him out as the fit successor to the stewardship, which fell vacant in July 1859. How he has fulfilled his duty in this capacity, the portrait painted by Ouless, and paid for by old students of the Hospital, which hangs in the Steward's room, sufficiently declares. The discharge of the duties of his new office was fascinating to him. He was for years never away from his office. The story goes—and if not exact in detail, it is certainly true in the main—that one summer he listened to the pressing call of a brother to visit him at his birthplace, Plymouth. Thither he went, and arrived in time for a festive gathering, at which he enjoyed himself vastly; but whether he could not sleep, or felt himself like a fish out of water, he was missing in the morning, and found in London in the afternoon. He had stolen away back to his office before his relations were stirring. Of later years

he made more holiday, and enjoyed his visits to Devonshire more contentedly.

There is a story, about which the writer has positive cognisance, which displays several of his characteristic traits. It deals with his manner of expressing his appreciation of kindness shown to a friend of his by a stranger.

The friend, a Devonshire man like himself, had a literary instinct, and had come to London to turn his gifts to account. Whatever his ability—and it was undoubted—the conversion of it into capital was not up to expectation. He therefore offered himself as a clerk to various men of business in the City. He was being sent away from one firm by the junior partner, when the deep voice of the senior partner—who had overheard the dialogue and recognised the Devonian accent—bade his junior "try him." He proved a valuable clerk, but after a year or two he fell ill, and was for long an invalid, coming irregularly, doing therefore but little work, and ultimately succumbing to disease. He was throughout kindly treated.

This touched Mark Morris. Now Morris was a collector of rare prints and drawings, so far as they came within reach of his purse, and he had got a pencil drawing by Charles Babbage —the inventor of the calculating machine—of Totnes, where Babbage was born, as seen from the lodge of the senior partner's estate. The drawing has Charles Babbage's signature upon it; it is therefore a valuable picture. Morris, quite a stranger to him who had befriended his friend, was so touched by his conduct, that he requested the writer to present the drawing in remembrance of the circumstance. This is a fair sample of Morris's tone of mind, delicately sensitive. This was more than thirty years ago, when his appetite for collecting was keen. He delighted in kindly acts, but shunned the display of them. The nurses, with whom he was in hourly communication, proclaim this. Missed as he may be by the staff, those over whom he had control will miss him more. It is not extravagant to say that he was universally loved by the nurses, because his justice, though rigid, was always tempered by sympathy and kindness.

Mark Morris was born at Stoke Damerne, Devon, in August 1818. Educated at Devonport Classical and Medical School, he became Sub-Curator of the Museum in 1840, Curator of the Surgery in June 1850, and Steward in July 1859. He was in active duty almost to the very last, having been in the service of the Hospital more than fifty-five years. He fell a victim

to influenza, which attacked him in the last part of the year, and from which, though able to return to duty, he never completely recovered. Gradually his strength failed, and when, within five weeks of his death, he finally took to his bed, it was clear that he would never rise from it again. He was with difficulty removed to his brother's house at Plymouth, where he died peacefully in November last.

SAINT BARTHOLOMEW'S HOSPITAL REPORTS.

A CASE OF ACTINOMYCOSIS OF THE THORACIC WALL.

BY

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

Ernest Dyer, æt. 19, engaged in upholstering work, was admitted to John Ward, May 10, 1895, suffering from pain and discharge from a wound in the left side.

May 11.—Ten months ago he had pain in the left side which lasted half an hour; he then had fever, with which he was laid up one week in bed, but did not return to work for six weeks. He remained well till November 1894, when he had another attack of pain in the left axilla, for which he had advice till Christmas, after which time he took to bed for two months and was treated with medicine. After he had been in bed for a month, a swelling appeared in the axilla, which was lanced, and two tablespoonfuls of greenish matter were removed. Since the end of February he has been up and about the house, but has not been at work. The wound in the chest has been discharging ever since about a teaspoonful every twenty-four hours. He got thinner when he was in bed, but has subsequently gained in weight. Has had no sweats.

Past History.—Measles in childhood. No other illness.

Family History.—Brothers three and sisters three (patient youngest). No history of phthisis. His father died of typhoid fever eighteen years ago. Mother 56, healthy.

Present Condition.—The patient is a thin, delicate-looking youth; he lies on his back and towards right side.

Cutaneous System.—His skin is hot and rather dry; there is no rash and no œdema. Last night his temperature was 101.2°, and it is normal this morning. The subcutaneous tissue is scanty and the skin is rather loose; he is anæmic. The wound of incision is granulating, and is in the fifth intercostal space outside nipple-line. There are several small discharging sinuses around it.

Respiratory System.—R. 40. There is marked retraction and impairment of the movement of the left side of the chest, and well-marked myoidema.

On the left side dulness in the axilla extends up to the fourth rib in nipple-line and horizontally into axilla; up to third costo-sternal articulation; the upper limit of dulness crosses the sternum at the level of the third space, and there is dulness up to the upper border of the fifth rib in right nipple-line. The left side is tender all over, especially over the dull area. The resonance is normal above the dulness.

V.R. and breath-sounds are absent over the dull area. The breath-sounds are weak above the dull area.

Immediately above and external to the nipple is heard well-marked pleuro-pericardial friction, a double rub corresponding with cardiac rhythm, but varying with the respiration, becoming markedly louder during inspiration.

Back.—Dulness and absent v.v. and breath-sounds not quite up to angle of left scapula. V.R. diminished much over the dull area. The breath-sounds are weak all over the left back. No friction to be heard, and no signs of bronchitis.

Circulatory System.—Pulse 136°, regular, of small volume and low tension; artery impalpable. The heart is normal but for the pleuro-pericardial friction described above. A beat impalpable. Sounds are best heard about the normal situation.

Digestive System.—Tongue moist and slightly furred. Abdomen, nil. B.O.

Genito-urinary System.—Urine, 1022; no albumen.

Neuromuscular, Osseous, and Arthritic Systems.—Nil.

May 14.—General condition a little improved since admission. Temperature hectic, rising to 101° in the evening. Respiration, 28. Pulse, 136. Physical signs on left side unaltered. The appetite is good. Patient sleeps well, but sweats at night. Double friction and friction-fremitus in lower part of the right axilla; this is new.

May 16.—Sputum examined for tubercle-bacilli. None found.

May 23.—There is still a little friction at the lower part of the right front. Signs on the left side unaltered. His weight

remains the same as on admission. Temperature has continued hectic.

May 27.—Chest examined this morning, and signs found to be as before. Still friction on the right side.

At 3.30 P.M. patient was removed to the operating theatre. Chloroform was administered, and Mr. Langton made a crescentic incision in the left axilla, turning back a flap about two inches broad, which included the whole of the involved skin. The subcutaneous tissue was found to be infiltrated with unhealthy-looking pus, in which were numerous small yellowish bodies, which, together with the multiple points of discharge, suggested the idea of actinomycosis, The rib was found to be bare, but not necrosed. No communication could be found with the pleural cavity, and none was made, it being thought advisable under the circumstances to open the pleura at another time, if necessary, through sound textures. The unhealthy tissue was scraped away, leaving a very thin flap; the wound was packed with iodoform gauze and dressed with salalembroth. The patient was returned to his bed, and recovered from the anæsthetic with very little sickness.

May 30.—Pus examined for actinomycosis; none was found. Nummular purulent sputum in considerable quantity to-day.

May 31.—Since operation the temperature has been only very slightly lower. Pulse, 116. Respiration, 36. Dulness up to the upper border of the third rib in left nipple-line, and just up to the angle of scapula behind. The sputum has been twice examined by Mr. Lloyd, but no tubercle-bacilli were found. The wound is being fomented every four hours, and about ℥i. pus (healthy) is removed at each dressing.

June 1.—There is distinct bulging of the lower intercostal spaces. On the left side extreme tenderness, and slight œdema at costal margin about nipple-line.

June 3.—Mr. Langton saw the patient yesterday; he requested that the chest might be explored with an aspirating needle before operation. This was done in the sixth space, 2½ inches outside left nipple-line, and some blood-stained pus withdrawn.

Coarse grating double friction felt and heard in right axilla. This morning Mr. Langton resected an inch of the sixth rib, 1½ inches outside left nipple-line, at 10.30 A.M. Rather less than an ounce of pus escaped, and a good deal of curdy lymph was removed (perhaps ½ ℥). The cavity was small, the limits being easily reached with the forefinger, but it extended farther backwards and downwards than in other directions. The cavity was not washed out. A tube of two inches was inserted.

June 4.—Pulse dicrotic, 7 P.M.

June 6.—The wound is being dressed every day; it is quite healthy. About ʒss. to ʒi. of pus escapes daily. The original tube still goes in easily.

June 8.—The patient remains ill, though better than before the operation. His temperature is above 101° every evening. Respiration and pulse remain rapid. His appetite is good; takes D.C. bacon, eggs ii., and porter oi. well. The tongue is clean. B.O. Very anæmic. Still slight friction in the right axilla. At the right base there is impaired resonance up to lower angle of scapula. No other signs of fluid or consolidation there. He sweats a good deal.

June 12.—To-day there is again a puffy swelling at the left costal margin internal to nipple-line, which distinctly fluctuates. Temperature is still hectic. The pulse and respiration are rapid. Temperature last night, 101·8°; pulse, 136; respiration, 40. There is "new leather" creaking in right axilla.

June 13.—Swelling on the left side rather larger. A beat, best felt in fourth space $\frac{3}{4}$ inch inside nipple-line, also in fifth space (faintly) $\frac{3}{4}$ inch inside nipple-line.

6.30 P.M.—The swelling above described has just been opened by a vertical incision one inch in length over the seventh space in left nipple-line; ʒi. of offensive pus was let out. On exploring with the finger, a communication with the pleural cavity was found, which admitted the little finger as far as the first phalangeal joint; the finger thus placed can reach the walls of the cavity inside the chest in every direction. The cavity was syringed out with $\frac{1}{2000}$ mercuric perchloride solution, and the wound was dressed with cyanide gauze. A tube two inches long was inserted. The operation was done under chloroform.

June 15.—There is not much change since the operation. The temperature is about the same. The pulse and respiration are unaltered. The wound has been dressed and syringed out once a day, and the tube has not been shortened. The tube was left out of the first wound on the 13th. There are about ʒii. of sweet pus in the dressings each day. He takes his food and sleeps well.

June 17.—Yesterday and to-day the patient has been coughing more than usual, and to-day he has commenced spitting up rusty sputum. R. and P. not increased. Dulness exists behind up to middle scapula at both bases, and there is crepitation on coughing on the left side, with br. br. bronchophony and +v.vib. over the dull area. On the right side the breathing is not bronchial; v.v. present but not +, and v.r.

is natural. Temperature up to the present has been subnormal every morning.

June 27.—The chest was yesterday explored in the left eighth left space in post-axillary line. About ℥i. of thick pus was withdrawn. It was again explored in the ninth space in the interscapular region; a syringe full of thick pus was withdrawn.

July 2.—On June 29 Mr. Langton cut down on the ninth interspace in the interscapular line; there was a small cavity containing about ʒi. of sweet pus; the limits of the cavity were easily reached in all directions with the forefinger. From the ninth space the cavity extended farthest upwards and backwards. The evening after the operation the temperature was 100° as against 101.6° the evening before. On the morning after the operation the temperature was, as usual, subnormal. On the evening of the 30th the temperature was 101.8°, and last night (July 1) 104°. At 3 A.M. this morning he had not slept well, and had bromidia ʒi. Shortly afterwards he became very faint, his face and lips livid, pulse scarcely perceptible, and his breathing very rapid. His hands and feet were cold. At 5.30 A.M. he had liq. strychnine ℥iii., which was repeated at 7 A.M., together with ʒss. brandy. After these measures he improved somewhat. At 7.30 A.M. he was given ether ℥xv. subcutaneously.

11 A.M.—Livid face and lips. His pulse was very small, and about 200. R. forced 72. Alæ nasi and sterno-mastoids were working. He was sweating. Hands still cold, and he is very restless.

The patient died in the afternoon.

Actinomycosis.—Mr. Berry's Post-mortem Notes.

Ernest Dyer, æt. 19. Post-mortem, 2.45, July 3.

External Appearance.—Very thin; over lower and outer part of left chest several unhealthy-looking sinuses, and a granulating wound as large as a half-crown. Farther back, an incised wound leading directly into left pleura close to the spine. A little dirty pus oozing from all sinuses.

Head.—Not examined.

Neck.—Larynx normal. Thyroid rather large and firm, full of secretion.

Chest.—Pleuræ: Right contained 50 oz. of turbid thin yellow fluid. Left contained about 12 oz. of similar fluid in a localised

cavity at the apex. Elsewhere, the pleura was universally adherent, except at base, where there was a large ragged cavity as big as a fœtal head. There were also several smaller collections of thick yellow pus at different parts of left pleural cavity.

Lungs.—Right completely collapsed; otherwise quite normal. Left: Lower two-thirds nearly solid (pneumonic consolidation); upper third collapsed, but otherwise normal.

Base of lung formed upper boundary of above-mentioned ragged cavity. Cavity appeared to have originated in lower part of left lung. Walls of it were in a shreddy, sloughing condition, and were very ill-defined.

The diaphragm had been completely perforated, so that the lower part of the cavity was formed by adherent liver and spleen. The amount of fluid in the cavity was small, the sinuses in the chest-wall opening directly into it. The soft, shreddy tissue was remarkably yellow, and there were numerous small yellow granules, as large as millet seeds, imbedded in it. It looked very like the tissue of actinomycosis, and a portion was sent to the Bacteriological Laboratory for further examination. (Examination by Dr. Kanthack showed characteristic actinomycosis.)

Mediastina.—Were much infiltrated with dirty yellow serum and yellowish pus.

Pericardium.—Universally adherent (old adhesions).

Heart.—Normal externally.

Spleen.—Rather large and soft.

Liver.—Much congested chronically.

Kidneys.—Showed slight congestion. No other disease.

Stomach, Intestines, Pancreas, Bladder, Testes.—All normal.

Remarks.

This case was supposed to be one of empyema which had been ineffectually treated before admission. In its progress it was thought probable that several loculated empyemata existed. Its course was so unsatisfactory that a suspicion of tuberculosis arose, but there was no evidence of this in the sputa. At the time of the first operation masses were found in the pus which justified the belief that there was actinomycosis. On examination of these, nothing characteristic of the ray-fungus was found by Dr. Kanthack. Another examination of the tissues, made after death by the same authority, gave unequivocal proof of the existence of actinomycosis. The first particles examined

had been placed in carbolic acid, and Dr. Kanthack believed that the fungus had thus been destroyed, and rendered incapable of recognition.

Failure to make an exact diagnosis during life added nothing to the risk of the poor patient. There was no other line of treatment available than that which was followed.

Cases of actinomycosis involving the chest-wall and subjacent viscera, the liver, and other internal organs, are always grave, and usually fatal. In most cases that I have seen it has been impossible to trace any direct connection with animals similarly affected. The mode of entry of this fungus into the body remains as yet very imperfectly understood. Animals are more subject to tumour-formation, and man to a form of burrowing suppuration, under the influence of the parasite. It appears most probable that it may enter the body from either the respiratory or the alimentary mucous surfaces, and so work its way to various organs. A record of three fatal cases is given in the *Boston Medical and Surgical Journal* for March 1895. In one, lesions were found in the lung, liver, brain, and kidney. The case was believed during life to be one of tuberculosis. No clue to the mode of infection was obtained. In the second case the right lung and left kidney were involved. In the third the kidneys and pelvic viscera were affected, chiefly the left ovary. A scar in the sigmoid flexure was believed to be the seat of infection. A fourth case, in a man, is reported in the same paper, in which a small swelling formed on the abdominal wall. On opening it, a purulent fluid exuded, together with two small fish-bones. Abundant actinomycoses were found in the pus and surrounding tissues. The bones were supposed to have ulcerated through the intestine, and in their track the fungus. The man made good progress.

Vide—(1.) A Case of Actinomycosis of the Intestinal and Urinary Tracts.
(2.) A Case of Actinomycosis of the Vermiform Appendix, causing Perityphilitis. By Dr. Ransom of Nottingham.
(3.) A Case of Actinomycosis of the Face and Neck. By Mr. A. R. Anderson of Nottingham.
Med.-Chir. Trans., vol. lxxv. 1892.

(In Dr. Ransom's case the fungus was believed to have been introduced by eating fresh ears of barley or wheat.)

ON SARCOMA OF THE BONES OF THE THIGH AND LEG.

BY

HENRY T. BUTLIN, F.R.C.S., AND F. E. A. COLBY, F.R.C.S.

In 1882 one of us published a small work on sarcoma and carcinoma,[1] in which several chapters were devoted to sarcoma of the bones. Deductions were made from a number of cases which had been collected from various sources, but the number was limited, for only those cases which had been verified by a microscopical examination were used. In order to test the truth of the deductions, and to add to our knowledge of this important subject, it occurred to us to collect all the cases of sarcoma of the bones of the lower extremity which have been treated in the Hospital during the last thirteen or fourteen years, and to discover, so far as possible, the later history of the patients. In one respect, a great improvement has taken place in the arrangements for the examination of tumours which have been removed in the Hospital during the last ten or more years. Formerly the general and microscopical examination of morbid growths was left to any one who would undertake it. The Surgical Registrars did not consider it a part of their duty to make a microscopical examination, or even to record it if it had been made. Certainly, the examination was generally made and sometimes recorded. But for some years past, morbid growths have been sent as a matter of routine to the Pathological Laboratory, where they have been examined, and the result of the microscopical examination recorded in a book kept for the purpose. We believe we are correct in saying that the credit of having established this valuable routine is due to Mr. Bowlby.

On the other hand, there is as great a difficulty as ever in tracing patients who have been treated in the Hospital, and in some cases it is quite impossible to complete the history. Nevertheless, we are in a position to offer some interesting information on some important points.

[1] "Sarcoma and Carcinoma," by Henry Trentham Butlin. London, 1882. J. & A. Churchill.

The SUBPERIOSTAL sarcomas of the *femur* are made up of five cases of round-celled sarcoma, five cases of spindle-celled sarcoma, and seven cases of mixed-celled sarcoma. The ages of the patients ranged from 13 years to 54 years. Eleven of them were males, six were females. The seat of the disease was the lower end of the bone in fourteen out of the seventeen patients. Thirteen of the tumours were "simple," neither organising nor sufficiently altered to merit remark. One of the round-celled and two of the mixed-celled tumours were ossifying, and one of the spindle-celled tumours was partly chondrified. The time which elapsed between the first observation of the disease and the operation in twelve cases was less than six months, and in nine of these was less than four months. In two, a very long time had elapsed before the operation was performed—seven years in one, two years in the other. The growth in both these cases was spindle-celled.

Amputation of the thigh or at the hip-joint was performed in every instance, and the results were extremely bad. Two patients were lost sight of. Two died of the operation. One patient suffered from recurrence of the disease, and the limb was amputated at the hip-joint; since that time she has died. Eleven other patients are reported to be dead; and with one exception, death occurred within a few months of the operation. The exception is the case of a woman whose thigh was amputated at the hip-joint for a chondrifying sarcoma of the upper third of the femur of two years' duration. She made a good recovery, and was reported to be well six months later; but she has since died, and we have no definite information of the date or manner of her death.

Unfortunately, several of the patients died at home, and no post-mortem examination was made; but in every instance in which it was made, extensive disease was discovered of the lungs, kidneys, bones, and diaphragm. And in several of the cases in which there was no autopsy, there was ample evidence of wide-spread disease. For example, a mother told us that her daughter, who died four months after amputation of the thigh, had "growths everywhere. The child kept finding new swellings," "and there was much spitting of blood." Another patient died five days after leaving the Hospital. There was then a tumour of one of the costal cartilages and signs of affection of the lungs. He was 21 years old. The tumour was a spindle-celled sarcoma, and had only been discovered between two and three months before the operation. The entire duration of the case was but four months.

A glance at the table will show with what rapidity the

disease proved fatal in spite of operation in the majority of cases.

Enlargement of the inguinal or femoral glands was observed in three cases, Nos. 1, 12, and 16; and it is curious that in two out of the three, the disease was situated in the lower third of the femur. But the opinions expressed on this point in 1882 need not be modified on this account. It was then suggested that the only cases in which the glands become involved are those in which the disease extends directly from the adjacent tissues into lymphatic glands, and thus gains access to other glands, or those in which the affection of lymphatic glands is part of a general dissemination of the disease. In Case 1, in addition to the kidney, diaphragm, and bones, the femoral, bronchial, pelvic, and mesenteric glands were the seat of round-celled sarcoma. In Case 16 (mixed-celled) the pelvic and inguinal glands were affected on both sides, and the patient was suffering from carcinoma of the uterus, to which the glandular disease was probably secondary. In Case 12 (also mixed-celled sarcoma) a young man died at home five months after amputation of the thigh for a tumour of four months' duration. There was no autopsy, but the groin glands were said to have been enlarged, and there were indications of growths in the lungs. But we have no precise information of the actual conditions.

Only one of the patients can be regarded as "cured" by operation, and the case is so unusual that it deserves a short notice. A man, 39 years of age, was admitted into the Hospital in October 1885, with a large swelling of the lower third of the femur, which occupied the anterior, posterior, and inner aspects of the bone, and only to a slight extent the outer side. It exhibited expansile pulsation and a distinct bruit, and diminished decidedly when the femoral artery was compressed. It seemed very uncertain whether there was actually a tumour, or whether the swelling was an aneurism. As he said he had been in the London Hospital in 1882, information was sought, and very courteously given, from the Surgical Registrar's notes, which had recorded, "Disease of knee, very obscure. Apparently a large soft exostosis on inner side of femur: on the other side, a soft swelling." The swelling had been punctured, but only blood had been drawn off. The man discharged himself from St. Bartholomew's, but returned in May 1886 with all the symptoms increased in severity. He could still walk, and the movements of the knee were unimpaired. Amputation was performed through the thigh about seven years after the first observation of the disease, and he made a good recovery. The

disease was a spindle-celled sarcoma, and is said to have been of sub-periosteal origin. The patient was in the Hospital again in January 1888, suffering from an orchitis of uncertain nature. He was at that time reported to be in other respects healthy. We now learn that he is dead, but he appears to have lived free from disease for more than three years after the operation, and we have not been able to ascertain the manner of his death.

In reviewing this case, we cannot but wonder whether it was really a very unusual case of sub-periosteal sarcoma, or perhaps a case of sarcoma of central origin. The very long duration of the disease before the operation is without a parallel in our experience. With one exception, the patient is the only one who can be claimed to have been cured of his sarcomatous disease out of the cases we have collected and those which formed the basis of the former work; and the account of the clinical characters of the tumour are sufficiently suspicious to justify a belief that it may have been of central origin. Even then its course must be regarded as very unusual.

The *central* sarcomas of the femur were only five in number, three in males, two in females. The ages of the patients were from 29 to 59 years. The lower third of the femur was the seat of disease in four of the five cases. All of the tumours were "simple," or free from mixture with bone, cartilage, &c. The duration to operation was less than twelve months in three of the cases; but in the two myeloid cases it was two years and five years.

Amputation was performed in every instance, and one patient died of the results of the operation. Not one of the patients can be claimed to have been cured. But, unfortunately, two were lost sight of immediately after they left the Hospital. Of the remaining two, a man, 29 years of age, died six months after the amputation of the thigh for a spindle-celled sarcoma; and his lungs, pleuræ, and popliteal vein were found to contain growths. The other patient, a man aged 40 years, was alive and well two years after amputation at the hip-joint for the removal of a round-celled sarcoma of the upper third, which was known to have existed about nine months.

The lymphatic glands were not affected either in this case or in that of the patient who died some months after the operation.

Again, there are only five cases of *sub-periosteal* sarcoma of the tibia, three spindle-celled and two mixed-celled. Three of the patients were males and two were females. The seat of the disease was the upper end of the bone in two cases, the middle of the shaft in two cases, and the lower end in one case.

Only one of the tumours was free from mixture with bone, cartilage, &c. The duration of the disease to the time of operation presents a marked contrast to the duration in the tumours of the femur. In the two mixed-celled tumours it was less than two months, but the three spindle-celled tumours had been noticed eighteen months, two years, and eight years before the disease was treated.

In four of the five cases the limb was amputated, and one of the patients has been lost sight of. A man, 45 years of age, died six months after the operation with affection of the lungs, the ribs, skull, clavicle, and femur; the tumour was spindle-celled. Both the other patients have done well. Another patient died within the year with recurrence in the stump, and with secondary disease of lungs, pleuræ, pericardium, and several of the bones. In neither of these cases were the lymphatic glands affected. An old woman, 72 years old, who suffered amputation of the thigh for the removal of a calcifying sarcoma of the upper third of the tibia of about eight years' duration, remained well until her death from old age seven years later.

But the first case is in some respects the most interesting of the series; for it appears to us to exhibit the mild character of sub-periosteal sarcoma of the tibia in comparison with the excessive malignancy of sub-periosteal sarcoma of the femur even more strikingly than the longer duration to operation, or the good result of the operation in the case which has been just referred to. The patient was a male, 21 years old. The tumour was situated at the junction of the upper and middle thirds of the bone, and had been noticed for eighteen months. It was about the size of a Tangerine orange, and was removed from off the surface of the bone in October 1886. It was a spindle-celled tumour, but contained bone, calcareous matter, and mucous tissue. In January 1887 a recurrence was removed, and in May of the same year a second recurrence was removed. The second recurrence was composed of oval and round cells. Since he left the Hospital after the third operation, it has not been possible to trace him. Even if the disease again recurred, and ultimately proved fatal, it is clear that the tumour did not exhibit such malignancy as would have been observed in sub-periosteal tumours of the femur. At the time of the last recurrence there was no affection of the glands, or of any of the distant parts of the body.

The *central* tumours of the tibia were eight in number, and seven of the eight were giant-celled or myeloid sarcomas. Four of the patients were males and four were females. The disease

was situated in the upper epiphysis of the tibia in every instance. The only case of spindle-celled tumour ended fatally about a year after the limb had been amputated at the knee-joint, but there was no autopsy, and the cause of death is not known. The cases of myeloid disease throw a very striking light on the nature of this variety of tumour. In one case, amputation was performed through the thigh and the patient has been lost sight of. In two other cases, amputation was performed through the knee-joint; one of the patients was well at the end of three years, the other five years after the amputation. In all the other cases, the tumour was gouged and scraped out of its cavity. One of the patients was well two years later; another was well two years later, but with a tiny sinus leading into the cavity from which the tumour had been removed; the third was well at the end of eight years, and the fourth patient suffered from recurrence at the end of two years. The thigh was then amputated, and nine years later the patient was reported to be well and free from disease.

In considering the question of *diagnosis*, we are struck with the fact that in no fewer than ten of the cases of sarcoma of the femur (six sub-periosteal and four central) the disease was thought to be chronic or subacute synovitis. In one or two of these cases the joint was actually invaded by the tumour, which had extended into it by way of the synovial membrane. In others, there was an effusion of fluid into it. But in most of them there was no real invasion of the joint, and in some the joint was intact, but was overlapped by the tumour. Only one of the tumours of the tibia had been treated as an affection of the knee-joint. The error of diagnosis is the more deserving of notice, because it was made, not merely in the surgery or in the out-patient department, but in the wards of the Hospital, when the patient was under the most careful and repeated examination. Several of the patients were brought into the theatre for consultation, and very various opinions were expressed on the nature of the disease. The difficulty was made greater by the fact that the temperature of the body was constantly raised in five of the ten cases of tumour of the femur. It was habitually 100° in most of them, and was as much as 102° in one case up to the day of amputation. The raising of the temperature has been reported from time to time in cases of rapidly growing sarcoma of the femur, but we did not know that it was of such frequent occurrence. It was observed in every kind of tumour, including one case of giant-celled sarcoma. We would particularly draw attention to the immunity of the shaft of the femur, in which sarcoma rarely originated,

especially central sarcoma. This is of great importance in the diagnosis between sarcoma and central necrosis.

Pulsation was only observed in three cases, two of sub-periosteal sarcoma of the femur, one of central giant-celled sarcoma of the tibia.

Egg-shell crackling was noted in five cases, all of them cases of central sarcoma of the tibia, and all of them giant-celled. In fact, it was present in no fewer than five of the seven cases of giant-celled sarcoma of the tibia.

If the cases contained in the accompanying tables are added to those contained in the tables in "Sarcoma and Carcinoma," the total number of 119 cases is reached of sarcoma of the long bones of the lower extremity; 66 sub-periosteal, 53 central; 71 of the femur, 43 of the tibia, and 5 of the fibula. We have not been able to add to the cases of sarcoma of the fibula. Only one case has been under treatment in the Hospital since the tables in "Sarcoma and Carcinoma" were published, and the patient was not submitted to an operation. All the tumours were examined microscopically, and the series is as complete as we have been able to make it. They illustrate several interesting points which are common to all sarcomas of the long bones of the lower extremity. For instance, the disease is much more common in males than females. Seventy-three of the patients were males, forty-five were females (in one case the sex is not mentioned). And the greater liability of males is exhibited in tumours of sub-periosteal and central origin; in the tumours of all three bones; in tumours of every variety. Perhaps it may be explained by the much greater frequency with which the bones of males are bruised and strained and injured.

The table of ages is equally instructive, and shows that the disease neither belongs to childhood nor to old age.

Below 5 years	3 cases
From 5 to 10 years	3 „
„ 10 to 20 years	35 „
„ 20 to 30 years	34 „
„ 30 to 40 years	16 „
„ 40 to 50 years	13 „
„ 50 to 60 years	9 „
„ 60 to 70 years	3 „
Above 70 years	1 „
Not stated	2 „
Total	119 cases

Malignant disease of these bones is therefore a disease of the prime of life, rare in young children, very rare in old people; most common during the period in which the greatest bodily activity is generally exhibited. In this respect it offers a great contrast to malignant disease of most organs and tissues, which shows a disposition to become more frequent with advancing age.

The tables prove, what has been stated by many authors, that sub-periosteal sarcomas are more dangerous than central sarcomas.

And they further serve to illustrate the truth of the proposition which has been put forward by one of us: That the mother-tissue largely influences the degree and kind of malignancy presented by a tumour.[1] The tumours of the femur are decidedly more malignant than the tumours of corresponding structure of the tibia; and this difference must depend, not on the mere closer vicinity of the disease of the femur to the trunk, and consequent greater ease with which the disease invades the viscera and glands, but on some intrinsic difference in the influence of the mother-tissue on the life-history of the disease. For the large majority of the tumours of the femur grew in or about its lower third, at a very little distance from the upper third of the tibia, which is the usual seat of the sarcomas of the leg.

The greater malignancy of the sarcomas of the thigh is exhibited in various ways. Their growth was so rapid that twenty-seven of the seventy-one patients were submitted to operation (generally to amputation) within four months of the first observation of the swelling, and in many of these patients the period was less than two months. And only in eleven of the seventy-one had the disease existed for as much as twelve months at the time of the operation. Of the forty-three patients who suffered from sarcoma of the tibia, only nine were treated by operation within four months of the first appearance of the tumour, and in no fewer than twenty-two of them the tumour had been observed for at least a year, often for a very much longer period.

Setting aside the patients who died of the immediate results of operation, the further history is known of forty of the patients with sarcoma of the femur, and of twenty-two of those with sarcoma of the tibia. Three of the patients with sarcoma of the femur may be claimed as cured, for they had remained well for a period of three years after the operation (or after the last operation), and four were still free from

[1] "Malignant Disease of the Larynx," p. 4, London, 1883.

disease at periods of from nine months to two years after operation. All the remaining thirty-three were dead. And although it cannot be averred that every one of these persons died of recurrence or of dissemination of the disease, it is quite certain that nearly all of them did so. Death took place within a few weeks or months of the operation, and many of them died with an extraordinary dissemination of the disease, both in relation to the number of secondary growths and the number of different organs or tissues which were attacked.

The case is very different of the patients who were treated for sarcoma of the tibia. Six of them may be claimed as cured, while five were well and free from sarcoma at periods of from one to two years after the operation, and only eleven were known to have died. These results are in spite of the long deferment of the operation in many of the cases, which is justly regarded as largely prejudicing the chances of the patient.

Of the influence of the structure of the tumours, we should say that, with one important exception, it matters comparatively little whether it is round-, or spindle-, or mixed-celled. All the varieties of tumour of the femur appear almost equally fatal and rapid in their course. Perhaps the round-celled tumours are the most active. And the tumours of the tibia do not exhibit much difference in their course according to whether they are composed of one or the other form of cell. The exception is that of the giant-celled or myeloid sarcomas. The results of amputation, and of the partial operations of shelling out and scraping out the tumour from the interior of the bone, were so excellent, while dissemination of the disease was scarcely once recorded, that we have been almost disposed to wonder whether these tumours, in spite of the mixture of spindle-cells or mixed forms of cells with the giant-cells, ought to be classed as sarcomas. Tumours, their large size and steady growth, and other characters, prove them certainly to be. But if they are sarcomas, they differ from the other varieties of sarcoma of the bones in a manner which the modification of their structure does not suffice to explain.

TABLE OF

	No.	Sex.	Age.	Seat.	Simple or Mixed.	Duration in Months previous to Operation.	Nature of Operation.	Total Duration in Months.	Recurrence.	Affection of Glands.	Affection of Lungs.
I. Femur.	1.	F.	13	3.3	Ossification	8	Amp. of thigh	11	No	Yes	Yes
	2.	M.	19	3.3	Simple	2	,,	10	Yes	...	...
Round-celled	3.	M.	54	1.3	,,	11	Amp. of hip-joint	11[1]	o	o	Yes
	4.	M.	34	3.3	,,	7	Amp. of thigh	14	...	...	...
	5.	F.	15	2.3	,,	4	,,	8	...	...	...
	6.	M.	20	3.3	,,	6	,,	...	...	...	...
	7.	M.	39	3.3	,,	84	,,	...	...	...	...
Spindle-celled	8.	F.	45	1.3	Cartilaginous	24	Amp. of hip-joint	...	...	...	...
	9.	F.	21	3.3	Simple	4	Amp. of thigh	17	o	...	Yes (?)
	10.	M.	21	3.3	,,	2½	,,	4	o	o	Yes (?)
	11.	M.	20	3.3	Ossification	3	,,	3[1]	...	o	o
	12.	M.	21	3.3	Simple	4	,,	9	o	Yes	Yes (?)
	13.	M.	17	3.3	Ossification	4	,	...	...	...	...
Mixed-celled	14.	M.	16	3 3	Simple	4	,,	8	...	...	...
	15.	M.	17	3.3	,,	4	,,	7	o	o	Yes (?)
	16.	F.	38	1.3	,,	6	Amp. of hip-joint	7	o	Yes	...
	17.	F.	30	3.3	,,	6	Amp. of thigh	...	Yes	...	...
II. Tibia.	18.	M.	21	2.3	Ossif. cartil.	18	Scraped	...	Yes	...	...
Spindle-celled	19.	F.	72	1.3	Calcification	96	Amp. of thigh	...	o	o	o
	20.	M.	45	3.3	Simple	24	Amp. below knee	30	o	o	Yes
Mixed-celled	21.	M.	17	1.3	Calcif. ossif.	2	Amp. of thigh	...	...	?	...
	22.	F.	16	2.3	Ossification	? ½	,,	(?)12	Yes	o	Yes

[1] Died of causes connected with the operation.

SUB-PERIOSTEAL SARCOMAS.

Affection of other Parts.	Authority.			Remarks.
Kidneys, diaphragm, and bones	F. K., St. B. H.,		1888	
...	H. A.,	,,	1889	Readmitted with recurrent growths, which were removed. Died "with returned disease" two months later.
Kidney and ureter	S. B.,	,,	1877	
...	W. M.,	,,	1877	No p.m.
...	E. G.,	,,	1883	No p.m. Died "with growths everywhere." The child "kept finding new swellings." Much spitting of blood.
...	J. R.,	,,	1884	
...	C. T.,	,,	1885	Admitted with orchitis in 1888. "Lungs natural." Is now (1894) dead.
...	L. L.,	,,	1888	Was well six months later. In 1894 said to be dead.
...	H. G.,	,,	1889	No p.m.
Costal cartilage	W. R.,	,,	1893	Died five days after discharge. No p.m.
o	W. M.,	,,	1884	
...	H. H.,	,,	1887	No p.m.
...	E. G.,	,,	1887	
...	E. D.,	,,	1889	No p.m.
...	W. C.,	,,	1891	No p.m.
...	F. D.,	,,	1876	Pelvic and inguinal glands both sides. She had also carcinoma of cervix uteri.
...	E. K.,	,,	1893	July 1894, amputation of hip for recurrence. Died June 1895. No p.m. Cause unknown.
...	J. C.,	,,	1886	1887, recurrence removed; 1887, five months later, ditto.
...	M. C.,	,,	1880	Died seven years afterwards of "old age."
Ribs, skull, clavicle, femur	F. B.,	,,	1892	
...	C. P.,	,,	1883	
Pleuræ, pericardium, bones	F. J.,	,,	1894	Died eleven months after operation.

TABLE OF

	No.	Sex.	Age.	Seat.	Simple or Mixed.	Duration in Months previous to Operation.	Nature of Operation.	Total Duration in Months.	Recurrence.	Affection of Glands.	Affection of Lungs.
I. Femur.											
Spindle-celled	1.	M.	40	1.3	Simple	9	Amp. of hip-joint	...	0	...	...
Mixed-celled	2.	M.	49	3.3	,,	10	Amp. of thigh	...	...	...	...
	3.	M.	29	3.3	,,	2	,,	8	0	0	Yes
Giant-celled	4.	F.	41	3.3	,,	60	,,	60[1]	...	...	...
	5.	F.	59	3.3	,,	24	,,	...	...	...	...
II. Tibia.											
Spindle-celled	6.	M.	18	1.3	,,	2	Amp. through knee	15	...	...	...
Giant-celled	7.	M.	25	1.3	,,	36	Amp. of thigh	...	...	...	...
	8.	F.	4	1.3	,,	10	Scraped	...	0	0	0
	9.	M.	13	1.3	,,	5	Amp. through knee	...	0	0	0
	10.	M.	22	1.3	,,	3	,,	...	0	0	0
	11.	F.	22	1.3	,,	24	Scraped	...	0	0	0
	12.	F.	32	1.3	,,	48	,,	...	0	0	0
	13.	F.	16	1.3	,,	8	,,	...	Yes	0	0

[1] Died of causes connected with the operation.

CENTRAL SARCOMAS.

Affection of other Parts.	Authority.			Remarks.
...	W. B. L., St. B. H.,		1892	Well two years later.
...	J. Q.,	,,	1892	
Pleura and popliteal vein	S. P.,	,,	1877	
...	S. B.,	,,	1889	
...	F. D.,	,,	1893	
...	W. J.,	,,	1886	Cause of death not known. No p.m.
o	A. G.,	,,	1884	
o	L. C.,	,,	1886	Well eight years later.
o	S. K.-H.,	,,	1889	Well five years later.
o	T. K.,	,,	1891	Well three years later.
o	C. G.,	,,	1892	Well two years later.
o	M. H.,	,,	1876	Well two years later, but with small sinus.
o	B. H.,	,,	1883	Thigh amputated for recurrence, 1885; well nine years later.

PARALYSIS OF CERTAIN MUSCLES OF THE HIP AND THIGH.

BY

J. A. ORMEROD, M.D.

In the four following cases there was paralysis predominating in the extensors of the knees or in the flexors of the hips.

A patient who has paralysis of the extensors of the knees cannot properly support himself when his knees are bent. In standing quite upright these muscles are not required, but directly the knees are bent, they must contract to keep the knee-joints rigid against the action of gravity which tends to flex them altogether. Therefore, though such patients can walk on the level, they do so in a constrained and cautious way, trying to avoid bending their knees; they have difficulty in walking upstairs or walking down (which can scarcely be done without flexion of the knee), in rising from their seat on a chair, or in sitting down slowly, and most of all in getting up off their knees.

This last action is a severe test of the muscle. Thus suppose the patient to be on one knee with the other foot advanced and ready to rise; a powerful contraction of the quadriceps is necessary even to initiate the action of rising, and to enable him to get his weight on to the advanced leg. This he will try to avoid either by catching hold of something or by resting his hands on the advanced knee; but once on his legs, he will not need, unless the extensors of his hips and spine be weak, to execute the manœuvre (so familiar in pseudo-hypertrophic paralysis) of "climbing up the thighs." The other muscle mainly concerned in rising from the knee is the gluteus maximus, which has to extend the hip-joint or maintain it in extension as the patient rises (the hamstrings being unable to do so while the knee is flexed). Doubtless the opponent muscles, viz., the hamstrings on the one hand and the iliaco-psoas on the other, are associated in this action, and exercise

a control over the extension of the knee and hip respectively, but the principal muscles concerned are the quadriceps cruris and the gluteus.

In my first case it will be observed that though the patient could not rise from his knees, direct examination showed no weakness of the quadriceps or gluteus, but only of the ilio-psoas. This may possibly be explained on the ground that the controlling action of the ilio-psoas was impaired; or, as I think more probable, on this ground, that rising from the knee is a severer test of the quadriceps than can be applied by examining directly its power of resisting artificial pressure.

Paralysis of the ilio-psoas is shown (as noted by Dr. Buzzard) in the difficulty the patient has in planting his foot on a stool or in raising it to go upstairs; but the foot once raised, it is mainly the quadriceps cruris that brings the weight on to it. Or suppose the patient sitting, he will find it difficult to cross his legs, because he cannot sufficiently flex the thigh with the paralysed ilio-psoas.

CASE I.—*Muscular dystrophy—Paralysis of the flexors of the hips, and probably of the extensors of the knees—Enlargement of the calves.*

Though the observations on the distribution of the paralysis are in this case incomplete, it is quoted because the nature of the disease seems clear, and may throw some light on the nature of the cases which follow.

A clergyman, æt. 35, consulted me in January 1888, complaining of loss of power in the legs, which troubled him chiefly in such movements as going upstairs, getting up from a chair, and rising from his knees. The inability to rise from his knees interfered very greatly with his clerical duties. He could walk well on level ground, but could not run.

The affection had come on gradually since the age of thirty; the first symptom noticed by him (in 1883) was the difficulty in running. Shortly before this he had had a slight attack of diphtheria. Previous health always good. No paralysis in his family.

Nothing very noticeable in his gait as he walks across the room. Can walk upstairs, but cannot manage two steps at a time. Has difficulty in rising from a chair. Cannot rise from his knees without catching hold of the table for support; in trying to do so he flexes one knee and thigh preparatory to rising, but cannot then get his weight on to that limb. When he stands up and bends forward towards the ground, he can

recover himself and get back to the upright position with ease, provided, he says, his knees are straight. The ease with which he thus recovered himself seemed to show that the glutei were sound; and it was therefore surprising to find that the quadriceps cruris showed no weakness to direct examination, for the patient could resist flexion of the knee-joint strongly, the muscle acted to faradism, and the knee-jerks were lively.

The patient was a large-made man, with well-developed muscles. On inspecting them, no definite wasting or hypertrophy was seen, except in the calf-muscles. These were decidedly large (though perhaps not hard), and had always been so: at college, the patient said, he had "won a competition for large calves." This fact suggested that his disabilities were due to muscular disease of the pseudo-hypertrophic type (muscular dystrophy of Erb). He was advised to continue the massage and electricity which he was already having at the hands of a skilled nurse.

I saw him twice again in the spring of 1888, and in May noted that the power of flexing the hip-joint against pressure was less than it should be.

In 1891 I saw him once again. He thought himself worse if anything. He had now a slight sideward lurch as he walked; he could not go up high stairs; in coming down stairs (he said), if his knee was bent and the foot caught a little, he was apt to fall. He sat down in a chair with a bump. Though the extensors of the knees, as tested by direct examination, still seemed strong, there was decided weakness of the flexors of the hips; thus he could not flex the thigh on the abdomen as he sat in a chair, nor, when lying down, flex them or keep them flexed against gravity. The knee-jerks were still lively. Throughout there had been no pain nor other sensory affection, no bladder nor rectal trouble.

Later in the year he wrote to me that he had consulted Professor Erb at Heidelberg, who had diagnosed his case as typical "dystrophia muscularis progressiva."

The next case I should also regard as a paralysis of the myopathic type, and so far resembling Case I.; but there was no enlargement of any muscle (some muscles indeed were small), and the extensors of the knees were more deeply affected, for they acted weakly against resistance, their electro-contractility was impaired, and the knee-jerks were absent. There had been an affection of the upper limbs, which had practically got well, and the lower limbs were observed to improve under treatment.

CASE II.—*Paralysis affecting mainly the flexors of the hips and extensors of the knees—Traces of a former affection of the arms.*

Jane P., æt. 36, single, a dressmaker, was brought under my notice by Dr. Bowman and Dr. Sevestre, complaining chiefly of a weakness in her knees which caused her to fall when walking; this had been coming on gradually during the last six years.

Brief observations in the out-patient room (May 22, 1894) appeared to show that she had paralysis of the flexors of the hips, most marked on the right side, with weakness of the extensors and flexors of the knee-joints. She walked carefully, with short steps, not advancing her legs properly. She could not, when sitting in a chair, cross one leg over the other, could not walk upstairs without holding on to the banisters, could not get up from the kneeling posture, could not turn over in bed from one side right on to the other without holding on to something. The knee-jerk was obtained on the left side, but not on the right; the quadriceps extensor cruris was thought to be small on both sides, and the right smaller than the left.

She became an in-patient under me on July 24, 1894, at Queen Square Hospital; the following account is mainly abstracted from the notes of Dr. Davidson and Dr. Warrington.

In her *early history* there was little that bore on her present condition. When seventeen or eighteen years old she had a feeling of numbness in the right leg, arm, and face, lasting half-an-hour. Five years ago, and again ten months later, she was operated upon at Blackheath Hospital, apparently for a growth in the vagina.

Family history.—Mother alive and well; father died of asthma; no paralysis known in family.

Present illness.—About seven years ago she caught her foot in a carpet and fell downstairs, landing at the bottom in a sitting posture; whether this had anything to do with her present illness is uncertain, but she has had a constant fear of falling since. Six years ago she noticed that she was tired after short walks, previously she had been a great walker. Then the right knee began to give way, and some twelve months afterwards the left. She could use her sewing-machine, but had to lift her legs on to the treadles with her hand. This weakness in the legs was followed gradually by some affection of the upper limbs, neck, and face, of somewhat uncertain nature. Thus she says that her neck used to twist to one side or backwards, and she had to put it back with her

hands. If she yawned widely, her jaw "used to get drawn away to the right" (affection of one external pterygoid?). Fourteen months ago she was advised to give up work and to rest altogether, and she has improved in consequence, but not in the lower limbs. She thinks that her memory has been failing for the last twelve months, but no deficiency in memory or in intelligence was noticed while in the Hospital.

Her present condition may be thus shortly given: She is a well-developed woman, except for the smallness of certain muscles which will be mentioned, and the general health is good, barring some menstrual irregularities. In walking on the level, she goes slowly and cautiously, taking short steps, advancing her feet imperfectly and lifting them but little; her gait is also unsteady, with a certain tendency to roll to the sides. She cannot walk with her eyes shut; cannot walk up or down stairs because her knees give way, the right knee first. In taking a seat, she comes down on the chair with a bang, and cannot get up again without holding on to something. She cannot cross her legs while sitting, cannot step up on to a stool, cannot rise from her knees. Her arms and hands she can now use in the ordinary way, neither is there now any affection of the face, neck, or head.

Examination of the Muscles.—The quadriceps cruris appear small on both sides.

Maximum measurements of thighs: right 13 inches, left $12\frac{3}{4}$ inches.

Maximum measurements of calves: right $11\frac{1}{4}$ inches, left $10\frac{3}{4}$ inches (the muscles of the left side generally being slightly smaller and more flaccid than those of the right).

She cannot lift the feet off the bed for more than half an inch (flexion of hip against gravity). She can bend either knee to a right angle and then extend it, but not against resistance.

The muscles of the shoulders and upper arms are small; she can use them, but not against firm resistance; those of the forearms and hands are quite strong.

There is no hypertrophy, no definite wasting of muscles (other than the smallness just noted), no fibrillary twitchings.

Electrical examination shows that while most of the muscles react normally to faradism, the extensors of the knees do not act at all; the gastrocnemii feebly; the deltoids very feebly, and only under a strong current. To galvanism the response is normal.

The knee-jerks are absent on both sides.

No affection of sensation, no pain; no affection of the sphincters; cranial nerves normal.

Treatment.—Liquor strychniæ, at first four minims three times daily by the mouth, then as injection into the quadriceps cruris three to five minims twice daily; galvanism to the thigh muscles daily.

She remained some months in the Hospital and improved considerably: thus on August 24 she could rise from a chair without help, and could step on to a low stool without much aid. On October 22 both quadriceps were found to contract under faradism, and towards the end of her stay she had decidedly improved in her walk.

Discharged November 22.

The nature of the third case is not certain; it may have been a muscular affection allied in nature to the first two. Certain points are worth notice, viz., the normal size and consistence of the muscles, the preservation of normal electro-contractility, the retention of the knee-jerks, the affection of the upper limbs, the marked effect of exercise in bringing out the muscular palsy.

This last fact was curious and striking. Considerable improvement took place after treatment had been given up.

Case III.—*Weakness, readily induced by slight exercise, of certain muscles in the lower and upper limbs, these muscles appearing in other respects normal.*

G. H. S., æt. 43, a blacksmith, was sent to me from Maidstone by Dr. Shaw, February 6, 1894. He complained principally of weakness of the legs; gradual onset during last five months. During the last three months some numbness and weakness in the arms. Gait cautious and uncertain; knee-jerks plus on both sides. Nothing obviously wrong with the arms, but as a minute examination was not made in the out-patient room, the peculiar effect of fatigue may have been missed. The patient was put on pot. iod. gr. x. ter die, and appeared to improve till cold weather set in, which he thought made his legs stiff and more useless.

Admitted under me, May 8, 1894, in Queen Square Hospital.

Abstract of Notes.—Nine months ago, weakness of lower limbs noticed when going upstairs; eight months ago, weakness of upper limbs in putting on coat, wielding hammer, &c.

On admission, weakness of the following muscles:—

In both upper limbs: of deltoids, esp. R.; triceps, esp. L.; biceps; extensors of fingers, R. only; flexor longus pollicis, esp. R.; flexor of wrists.

In both lower limbs: of flexors of hips; of quadriceps cruris, esp. R.; of flexors and extensors of ankles.

(This muscular weakness became much more pronounced after slight continuous use of the muscles, *e.g.*, in walking up and down the ward.)

Knee-jerks normal. No wasting nor hypertrophy of muscle, no reaction of degeneration, no fibrillary twitchings. No sensory affection, nor affection of sphincters. Slight fine nystagmus on lateral deviation of eyes; occasional slight diplopia.

Little improvement while in the Hospital; considerable improvement after his discharge.

The following in-patient notes are due to my then house-physician, Dr. Warrington, who studied the case with great care.

The patient is a tall, well-made man, in good general health; has been married twenty-three years; no signs nor history of syphilis; circumstances comfortable, habits temperate; no cause for present illness known. Family history negative.

Nine months ago, while carrying a weight (1½ cwt.) upstairs, his legs gave way; he got up, however, and finished what he had to do. No more trouble for a few days, when he thought his legs weak in walking. This increased till five months ago. Now he cannot get upstairs without support, and has special difficulty in walking downhill.

About eight months ago he found himself unable to put on his coat easily, and soon after had difficulty in using his hammer. This increased gradually, and four months ago he gave up work.

Present Condition.—Gait is cautious, small steps being taken, and the thighs only slightly flexed. There is no dragging of the toes, and the legs are advanced forward in a straight line. After walking a few times up and down the ward he feels tired, and as if his knees gave way under him.

Muscles of Lower Limbs.—Flexors of hips: These are weak and tire very soon. When he sits on a chair, and tries to place one thigh over the other, he can often manage it at the first attempt, but if at all tired he quite fails to do so. (We used to test the endurance of the muscle by trying how often he could repeat this action, and found that he could, as a rule, only do it eight times running.)

Extensors of hips: Fairly strong.

Abductors and adductors of thighs: Strong.

Extensors of knees: These very soon become weak after any exertion; the L. is weaker than the R. Rising from the kneeling posture in the ordinary way is impossible. When fresh, he

can rise from sitting in a chair without aid, but after a few efforts he is unable to do so.

Flexors of knees: Strong.

Flexors and extensors of feet: Both weak; he cannot stand on tiptoe or his heels.

Inversion and eversion of foot can be performed naturally.

Muscles of the Upper Limbs.—Deltoids weak, R. slightly weaker than L. The arm cannot be held out from the sides against slight resistance.

Latissimi: Perhaps slightly weaker than natural.

Serrati, trapezii, pectorals: Natural.

Triceps and biceps: Very weak both sides (the L. weaker than the R.)—that is to say, they soon become exhausted, though fairly strong when he first uses them.

Supinator longus: Strong on both sides.

Flexors of wrists: Soon tired, especially L.

Extensors of wrists: Strong.

Radial and ulnar flexion good.

Flexors of fingers: Apparently strong, though patient thinks them weaker than formerly.

Extensors of fingers weak on R. side, especially, it would seem, the extensor of the middle finger.

Flexor longus pollicis: Very weak, especially on R. side; as a consequence he cannot write.

Intrinsic muscles of hands: Strong.

There was no abnormality in the size or consistence of any muscle, except that the deltoids and upper arm muscles seemed rather flabby, and (except that the deltoids responded rather feebly to faradism) the electrical reactions were normal.

Knee-jerks equal and moderate. No tendon reactions obtained in the upper extremities. Plantar reflexes not obtained; skin reflexes otherwise normal. Perfect control over sphincters.

Slight nystagmoid jerkings, of small range, seen during lateral deviation of the eyes. In other respects the cranial nerves were normal. Special senses normal.

He was treated with faradisation, passive movements, and massage of the limbs; with iron, and then with sodium hypophosphite internally; next with hypodermic injection of strychnia (up to six minims twice a day), but no material change was noted.

Discharged August 4th, going to Sandgate Convalescent Home.

September 4.—Decidedly better. Says his arms are stronger; that he can get upstairs better; that he has been able to walk

1½ miles. Can now cross his legs while sitting twenty-two times running.

October 9.—Can now get up from kneeling with very little help. Can step up on to a low couch. Still fine slight nystagmus on fixing to left. Flexor longus pollicis still weak.

Has had no treatment since leaving the Hospital. Ordered to have T. nucis vomicæ ℥v. ter die.

December 11.—Is now able to do a little hammer-work, but has from time to time to put the hammer down. Flexor longus pollicis still weak. Can kneel down without help, and get up again, the left leg first without help, the right leg first with very little. Evident improvement. Says he is better without alcohol or tobacco.

The next case differs from all the preceding ones in that there was pain and tenderness. The situation of the tenderness, viz., deep in the abdomen, suggested at first sight disease in or near the lumbar vertebræ; but this idea could not be definitely substantiated, and the rapid and complete recovery militates against it. A symmetrical neuritis of branches of the lumbar plexus is another possible explanation of her symptoms. The history was remarkable, the patient affirming that she had had repeated attacks of the disease, commencing always in the fifth month of pregnancy, and always getting well in time after delivery.

CASE IV.—*Loss of power in muscles of thighs, occurring during each pregnancy—Pain—Abdominal tenderness—Absence of knee-jerks.*

Amelia C., æt. 31, married, was also handed over to me by Dr. Sevestre, who had made out the main points as follows (May 1894):—

For some three years she had been complaining of weakness and inability to walk well, with constant pain about the legs and thighs, and more recently pain in the left iliac fossa. This dated from a confinement (more strictly from a pregnancy, *vide infra*), and she had had three similar attacks, coming on under the same conditions. Distinct diminution of power in the movements of the hips. Knee-jerks absent. Sensation normal.

She became an out-patient under me at Queen Square on June 26, 1894, when the following note was taken:—

Gait laborious; does not advance feet to the front much; pelvis tilts and trunk inclines from side to side. Cannot step up on to a chair, "because it would hurt her." Cannot get up from kneeling posture, "because she cannot, and because it would

hurt her." Flexion at hips weak, and hurts her. Adduction of thighs strong, but when I try to separate her knees against her resistance it hurts her. Movements at knee-joints and ankle-joints strong. Knee-jerks absent (or, at most, a doubtful jerk on right side).

In the abdomen nothing can be felt, but on pressing deeply on to the vertebral column on either side there is tenderness. Tenderness on pressure also in the groins, where there are little knotty glands. On flexing left hip, pain passing round to the groin. Tenderness on pressing the iliac crests towards each other. Tenderness over lower part of spinal column. Ordered syr. ferri iodid. 3ss. ter die.

September 4.—Decidedly better. Walk still slow and cautious. Now can cross one knee over the other while sitting in a chair (this she could not previously do with left knee). Can get up from kneeling by pressing her hands on the thighs. Can go upstairs better. Knee-jerks still absent.

She became an in-patient under me on September 10, 1894. The notes were taken by Dr. Davidson. (It must be remembered that she was now much better than when first seen.)

History.—Ten years ago, while pregnant with her first child, the patient noticed that she "rocked" while walking. This began when she was five months gone, and increased during the rest of the pregnancy, though it never quite prevented her walking. The difficulty in walking consisted in weakness at the hips and lower part of the back, with pain at these parts when she walked. Could not easily walk alone, and preferred to support herself on the furniture. Could not raise herself from her knees. Could not get up from the sitting posture without help. Arms not affected. The confinement was difficult; she got worse after it. Then attended as an out-patient at the London Hospital, and got well after three months' treatment.

Eight years ago, when five months pregnant with her second child, weakness came on in the legs, and continued for two months after delivery.

The next pregnancy resulted in a miscarriage at three months, and she had no paralysis.

Six years ago, when five months pregnant with her third child, a similar affection occurred, lasting till two months after the birth of the child.

The present attack has lasted much longer. It began some four years ago, while five months pregnant with her fourth child. There was difficulty in walking, accompanied by pain in the hips and lower part of the back. The weakness got gradually worse, and about eighteen months after delivery

the shoulders became affected, so that she could not lift her hands to her head, the left arm being the worst.[1] There was pain, but only on movement. She lost flesh uniformly. She occasionally had some pain in the left iliac region.

No previous illness. No history of rheumatism. Married ten years. Four children born alive; two of them have died (teething, cough, &c.), and two miscarriages. All her attacks have begun (as above stated) at the fifth month of a normal pregnancy.

Family history negative. Father dead (cause of death unknown to her); mother, four sisters, and three brothers alive and well.

Poorly nourished, but appears otherwise in good health.

Gait.—Walks unsteadily, and swings left leg as she brings it forward. Can rise from a chair with slight assistance; to rise from her knees she requires much more assistance, either supporting herself on the table or pressing her hand on her knee. Can go upstairs, but this tires her much, and her left leg seems to give way at the hip. The same thing occurs when she goes downstairs, the special difficulty being when she puts all her weight on the left leg. As she sits, she can cross one knee over the other easily (the left more stiffly than the right). Can stand on tiptoe easily.

Muscular power as tested when lying down.—Flexion of hips fair, but very feeble against slight resistance. Adduction and abduction weak; cannot be done against slight resistance. Flexion and extension at knees fairly good; flexion weaker than extension. Movements at ankles and of toes good.

Abdominal muscles: Patient can just sit up in bed without assistance.

Upper limbs practically normal.

No definite wasting nor hypertrophy of muscle, though left quadriceps cruris seems smaller than right.

Measurements of Lower Limbs.—Eight inches above condyles, right 14 inches, left $13\frac{1}{2}$ inches. Five inches below condyles, right $10\frac{1}{2}$ inches, left $10\frac{1}{2}$ inches.

No fibrillary twitchings.

Knee-jerks not obtained (some doubt about right).

Electrical reactions normal; indeed, the quadriceps cruris on both sides responds with unusual readiness to faradism.

Sensation normal, except for tenderness to pressure on tenth dorsal spine, or on pressing iliac crests together.

September 14.—Both knee-jerks obtained, though with some

[1] The patient had not made this statement to Dr. Sevestre or myself. The importance of it is obvious, because the arms could not be affected by a purely local lesion in the pelvis or abdomen, such as pressure from the enlarging uterus, &c

difficulty. Still some pain on deep abdominal pressure directed towards left side of first lumbar vertebra.

Gait is now practically normal. Can step up on to a low chair. Can rise from knees aided by very slight pressure of her hand on her thigh. Can sit down and get up from her chair quite easily.

September 21.—Knee-jerks can be obtained with reinforcement, but not always.

October 8.—Knee-jerks easily obtained with reinforcement.

Discharged, being now practically well.

A CASE OF IDIOPATHIC DILATATION OF THE SIGMOID FLEXURE.

BY

W. P. HERRINGHAM, M.D., AND W. BRUCE CLARKE.

The patient, an old gentleman of over 70, had been suffering for eight days from want of action of the bowels, when he was first seen by one of us in consultation.

He had always been of an extremely constipated habit. For this he had at one time, several years ago, taken every day large enemata of soap and water. But he had given up this practice, and had since then used various aperients. Five years ago he had a similar attack to that which he was now experiencing, in which, after many days' inaction, the bowels had at length been made to act by strong purgatives. For the last six months he had had little or no trouble. The bowels had been open regularly without more than an occasional mild aperient. His health had been better than for a long time previously.

When he was seen, the case was evidently one of chronic, not acute obstruction. There was some discomfort, but no pronounced distress; the abdomen was somewhat distended, but moved freely, and was not tender. There were no signs of free fluid. No tumour could be felt, and nothing abnormal could be found by rectal examination.

There was no history of wasting or diarrhœa, or of anything pointing to malignant disease.

The absence of any definite evidence to the contrary, and the history of the previous attack, led to the diagnosis of fæcal impaction, or some non-malignant constriction above the rectum. Attempts were made for two days by enemata, by purgatives, and by the passage of a long tube, to overcome the obstruction, but without avail. On the third day the patient was worse, the

pulse and respiration rates were quicker, and there was more distress. It was therefore decided to open the bowel, and he was brought a few miles in a carriage as carefully as it could be done for that purpose. The operation was performed late in the evening.

The peritoneum was found to contain fæces, the gut having given way. It was rapidly flushed; the opening in the gut was enlarged and sewn to the abdominal wall. He rallied after the operation, but sank and died early the following morning.

The post-mortem appearances were as follows:[1]—

On opening the abdomen, much liquid fæces were found in it; the intestines were smeared with lymph and lightly glued together.

The stomach, small intestine, ascending, transverse, and descending colon were all normal in appearance and position. The diameters of the colon were 3 inches at the cæcum, 2 inches at the middle of the transverse colon, and only a little more than an inch at the termination of the descending colon.

The sigmoid flexure was enormously distended, and in size and shape resembled a somewhat dilated stomach upside down. It extended up into the left hypochondriac and epigastric regions; in the latter it was adherent to the anterior abdominal wall, and was opened in the first post-mortem incision into the abdomen.

From the upper and right-hand corner an hypertrophied appendix epiploica passed to the falciform ligament and liver, to which it was loosely adherent. The great omentum was attached to the front of this distended loop. There were also several old adhesions of omentum, chiefly in the left hypochondrium. The wall of the dilated sac was much thickened, evidently from hypertrophy. The inner surface was extensively ulcerated. The wall was black and gangrenous in several places, and in more than one had given way, allowing fæcal extravasation into the peritoneal cavity. At neither end of the distended loop was there anything like a stricture or new growth, nor evidence of any pressure by a band.

The rectum was quite normal.

These cases appear to be of some rarity. We have been able to find only the following cases recorded in recent times:—

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[1] The post-mortem examination was made by Mr. James Berry, whose notes are here transcribed.

Case.	Observer.	Sex.	Age.	Part Affected.
1.	Banks, Proc. Roy. Soc. of Dublin, 1849, vol. i. p. 249.	M.	50.	Sigmoid flexure.
2.	Chapman, Brit. Med. Jour., 1878, vol. i. p. 566.	M.	58.	Sigmoid flexure (a deaf mute).
3.	Money & Paget, Clin. Trans., 1888, vol. xxi. p. 103.	M.	55.	Sigmoid flexure chiefly, rest of colon and rectum somewhat.
4.	Little and Callaway, Path. Trans., vol. iii. p. 106.	M.	34.	Descending colon and sigmoid enormously, transverse colon somewhat (an idiot).
5.	Peacock, Path. Trans., vol. xxiii. p. 104.	M.	28.	From the cæcum to the lower end of sigmoid.
6.	Goodhart, Clin. Trans., 1880, vol. xiv. p. 84.	F.	17.	From hepatic flexure to anus.
7.	Bristowe, Brit. Med. Jour., 1885, vol. i. p. 1085.	F.	8.	Cæcum to two inches from anus.
8.	Bristowe, Brit. Med. Jour., 1885, vol. i. p. 1085.	M.	24.	Cæcum to three inches from anus.
9.	Gee, St. Barth. Hosp. Rep., vol. xx. p. 21.	M.	$4\frac{1}{2}$.	Sigmoid and rectum.
10.	Gee, St. Barth. Hosp. Rep., vol. xx. p. 21 (seen with Dr. Galton).	M.	4.	Descending colon and upper part of sigmoid.
11.	Walker and Griffiths, Brit. Med. Journ., 1893, vol. ii. p. 230.	M.	11.	Transverse and descending colon, ending gradually in middle of sigmoid.

The case now reported is hereinafter called the 12th case.

Other cases, which were at the time of reporting still under observation, are mentioned by Bristowe (*loc. cit.*), Osler (Johns Hopkins Hosp. Bulletin, iv. 30, "Cases of Dilatation of the Colon in Young Children"), and Price Morris (Brit. Med. Jour., 1886, ii. 1211). Osler refers to a paper by Formad, which we have not been able to read. Money mentions that he has seen two fatal cases in children.

It will be noticed that the first three cases, in which, as in the case now reported, the sigmoid flexure was alone or chiefly affected, were all in men beyond middle life. In one case (Chapman's) there is no clinical history; the patient was in an asylum. Banks' patient had had similar attacks previously, though none so severe as the last. With these exceptions his bowels had been moved regularly. Money and Paget's patient had been suffering for some months with gradually increasing

distension. This was relieved by puncture of the intestine several times repeated, and he recovered for the time, but died shortly afterward of delirium tremens. His bowels had always been regular, though lately somewhat constipated.

The remaining cases seem to fall into a different natural group. The dilatation affected a much greater length of the intestine, and the patients were much younger. The clinical histories also differ somewhat from the former. Thus Little's case, an idiot, had often suffered from over-distension. Peacock's patient had been constipated from birth, and had once, eleven years before, had a great fæcal accumulation removed from the rectum. Goodhart's patient had been ailing for a few months only. Her symptoms corresponded with those of tabes mesenterica. She died from acute peritonitis, due to perforation. The clinical history of Bristowe's cases is not given. Walker and Griffiths' patient had suffered with great distension ever since birth, and so had the two cases recorded by Dr. Gee.

It is worthy of note that of the twelve cases which died only two were females.

In several cases the coats of the bowel were found hypertrophied (Cases Nos. 3, 4, 6, 7, 8, 9, 11, 12). Griffiths examined his case microscopically, and reports great hypertrophy of the muscular, and chronic inflammation of the mucous coat. This process had advanced to ulceration in Nos. 5, 6, 7, 8, 12. In two cases death may be ascribed to perforation (Nos. 6, 12). Peritonitis, or traces of it, were found in four cases (Nos. 2, 6, 10, 12).

We think it may be truly said that in no case but No. 10 has any clear explanation of the condition been possible. Money suggests that "twisting of the sigmoid flexure may have caused a potential and intermittent occlusion of the lumen of the bowel." Goodhart concludes that the distension was paralytic and the ulceration secondary. Dr. Gee says of No. 9, "I think that mere constipation and retention of wind are the cause of the dilatation." In No. 10 Dr. Galton found that a hard scybalous mass which had been felt in the right iliac fossa was lodged in the middle of the sigmoid flexure. The gut below this was empty and contracted; the part above was enormously distended. The sigmoid flexure in this and the preceding case, No. 9, formed a great sac stretching across the abdomen.

It is difficult to understand why paralytic conditions, with which one may class constipation, should be so local in their effect as they sometimes seem to be, and so difficult of recovery. Osler, for instance (*loc. cit.*), relates a case of a child of seven months which from birth could only be relieved by enemata,

and for two weeks had been extremely distended. A catheter was passed, and after eight inches had been inserted a great escape of gas followed, and if water had previously been injected, fluid fæces also came out, while the belly at once became flat and soft. Yet the gut could not recover, nor perform its own functions for itself, and for eight months during which it was watched the condition remained the same. Still, upon the whole, this explanation seems to me the most likely for the second group of cases. For the first group we are inclined to adopt Dr. Money's view, and to look to a kinking of the sigmoid flexure as the most likely cause.

Appendix by Mr. Bruce Clarke.

Operation.—There are one or two points in connection with this case, which I saw in consultation with Dr. Herringham, which are of considerable surgical interest. Dr. Herringham has already remarked that as soon as the peritoneal cavity was reached it was found to be full of liquid fæces.

(1.) By abundant washings of warm water the abdominal cavity was all but cleared of fæcal matter, and at the post-mortem was found to be fairly clear.

(2.) The patient was allowed to come to from the anæsthetic as soon as the cutting part of the operation was over, in accordance with the plan advocated by Mr. Greig Smith, and complained of no pain whatever in its later stages.

(3.) For some time (about an hour) he was quite himself, and able to recognise his friends, and possibly, had he been some years younger, might have recovered from the effects of the operation.

Addendum.

Since writing the above, a case of dilatation of the transverse colon has occurred in this Hospital, under Dr. Church's care, which, though unlike the preceding, may throw light upon their causes :—

Theresa V., 4 months.—On December 1, 1895, diarrhœa began, and has lasted ever since. Admitted December 10 ; very ill. Constant vomiting and diarrhœa. December 14—Abdomen distended. December 18—Much more distended, especially in the upper half. Gut punctured in three places and much flatus discharged. Much relief. December 19—Again very distended. Died.

Post-mortem (vol. xxii. No. 348, from Notes by Dr. Garrod).—From about the middle of the ascending to the upper part of the descending colon the large intestine was enormously distended. The enlargement

began and ended gradually, funnel-wise ; the gut below the enlargement was of natural size and quite pervious ; there was no kink and no external compression. The peritoneal surface of the distended part was inflamed and adherent by recent lymph to the neighbouring viscera, but there was no general peritonitis. The mucous surface of the same part was deeply injected, and covered with small ulcers ; in the rest of the colon the follicles were swollen and injected. The wall of the distended part was very thin.

In this unusual case the sequence of events was probably follicular colitis, with diarrhœa, paralysis of the gut by extension of inflammation to its muscular coat, then dilatation, and lastly extension of the inflammation to the peritoneal coat. The condition of the mucous membrane was perhaps partly consequent on the dilatation.

SOME OUT-PATIENT OBSERVATIONS ON EPILEPSY.

BY

H. H. TOOTH, M.D.

When large numbers of cases of any disease are taken together and analysed, deductions and generalisations made from them possess a certain value directly proportional to the number of the cases and the accuracy of the diagnosis. This is especially the case in the consideration of epilepsy, which has been so often confounded with hysteroid convulsions. In this communication, care has been taken that all the cases which form its basis of fact shall be true epileptics. The total number of cases from which they have been drawn probably amounts to about 2000, but by exclusion of all doubtful cases, the number is reduced to 897, a figure sufficiently high to ensure fair accuracy in generalisation. They have all been under my own personal supervision for periods up to five years, but many are old patients of the hospital (the National Hospital for the Paralysed and Epileptic), and have attended, with more or less regularity, for upwards of twenty years.

Sex.—Of the total number, 897, we find 442, or 49.3 per cent., males, and 455, or 50.6 per cent., females. There is, therefore, a slight preponderance on the female side. Gower finds this preponderance more marked, namely, males, 48 per cent., and females 52 per cent.

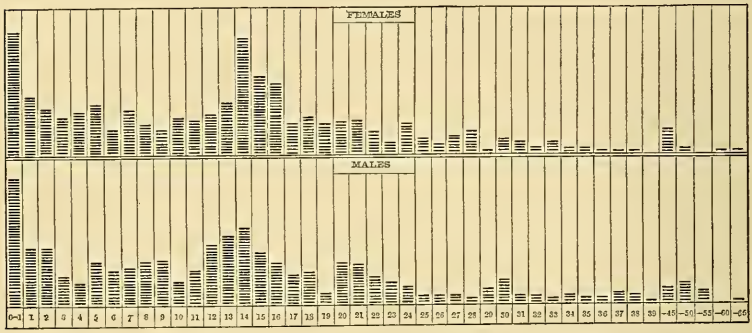
The liability of each sex is, therefore, not far from equal.

Age and Onset.—This is the date of the first fit. It may be a single one, and there may be no other for many years. The table below indicates graphically the numbers and ages of patients at the time of onset in years up to 40, and quinquennial periods from that age to 65.

It will again be seen that the numbers for each age are very similar in the two sexes. In the larger number of instances the initial convulsion takes place in the period of early infancy,

—that is, up to twelve months—44 males and 42 females, or nearly 10 per cent.; but if we add the next two years, covering the period of teething, we find that 18.4 per cent. of the total number fall in this period. At this age the male cases seem to preponderate, but the difference between the two sexes is slight—84 males and 79 females. In fact, it might almost be expected that the male cases would be in more marked excess when we consider the greater difficulty generally experienced in rearing male children. Reference should here be made to the observation of Jenner, that convulsions are notoriously common in rickets. Gowers remarks that, in consideration of

TABLE OF AGE AT ONSET.



the preventable nature of most cases of rickets, "a considerable proportion of the cases of epilepsy are really within the range of preventable diseases."

Then comes a period of years from 3 to 11 inclusive, during which both sexes are moderately liable to the onset of the disease, 105 males, 113 females, or a total percentage of 24.7.

The next six years, 11 to 16 inclusive, are very interesting ones in both sexes. These years, including the most usual ages for the establishment of the menstrual function, would naturally be expected to be vulnerable ones among females; we are therefore not surprised to see the figures rise to culminate at the age of 14, the total number of females being for the six years 124. But we are less prepared for a similar, though rather more moderate rise, among the boys, reaching its maximum at 14, as in the girls. The total number of boys for the six years is 106, and the percentage of both sexes combined is 26.

The period of life from 17 to 24 inclusive, that of adolescence, is marked by a distinct fall in the number of both sexes, which

are practically equal—76 males and 77 females, a total percentage of 17.3.

The years 20 and 21 appear to be marked in the men by a peculiar liability to the onset of the disease, but this may be an accidental arrangement of the figures. There can be little doubt that at that age men are very liable to functional disease, and emotional or hysteroid outbreaks generally, and that this period may be comparable to the first menstruation in girls.

After the age of 24 the onset of the disease is comparatively rare; thus, 64 men and 56 women for the years 25 to 65 inclusive, a total percentage of 13.6, with a preponderance against the men. It is probable that in the larger number of these cases the convulsions are symptomatic of some definite underlying degenerative change of alcoholic, syphilitic, or toxic origin, acquired rather than inherited.

The figures above quoted agree in the main with those of Gowers, namely, of the total number investigated by him, in 75 per cent. the onset of the disease occurs at ages under 20.

For reasons above stated, we should, I think, extend the age to 24 inclusive, and then we find that 86.3 per cent. began to suffer from epilepsy before that age.

Exciting Cause.—This subject must be approached with all caution and reservation. The untrained mind is ever liable to be led astray by the *post hoc* form of argument. Hence we find slight falls, or other apparently inadequate injuries, credited with being the direct cause of fits occurring years after. This desire to assign a cause, which exists in all persons, has a certain value, inasmuch as it serves to emphasise the fact that in a total of 442 males, 384 or 86.8 per cent., and of 455 females, 380 or 83.5 per cent., no cause of any kind could be alleged.

A supposed cause of some sort was alleged in 13.2 per cent. of the male and 16.5 per cent. of the female cases.

We have divided all the cases in which a cause was alleged into two categories, according to the degree of probability attaching to the circumstances given as a cause.

1. *Alleged Cause.*—Cases in which the cause given is not impossible. Among these we find "fright" and "a fall" given most commonly. It seems not unreasonable to consider these two together, for there is little doubt that the effect of a "fall" on a "nervous" person is more likely to be psychical than physical. Of all the alleged causes, we find "fright" or "fall" among the males in 46.1 per cent., and among the females in 55.8 per cent. The rest of the alleged causes are very various, and among them may be mentioned head injury,

worms, typhoid fever, rheumatic fever, scarlet fever, influenza, &c., the whole amounting to totals of 26 males and 43 females.

2. *Probable Cause*, or cases in which the cause alleged bears on the face of it some more or less strong appearance of probability. Among these, teething comes first, a point already considered under age at onset. When a person is said to have been epileptic since infancy, it is probable that, in a large number of the cases, the cortical instability was set up by the peripheral irritation of teething. A long interval may elapse between the convulsive outbreak of the teething period and the establishment of true epilepsy, sometimes six to eight or more years. This reminds us of the long interval that frequently intervenes between the first and second epileptic attacks in the later periods of life. We know that teething fits are very common, but what requires to be ascertained is how many of such cases become in after life epileptics. This is a point which might be cleared up by collective investigation.

Fright and shock, including "blow on head," are recorded in 11 of the male cases and 18 of the females.

Thus we see that psychical causes, whether alleged only or probable, are the most common, and that as causes they operate more frequently among females than males. The small number of cases in which a cause, whether adequate or not, is given, is rather striking; but this may be due to the rigid exclusion of all hysteroid cases.

Heredity.—This part of the subject is full of difficulties, chiefly due to inaccuracy and ignorance on the part of the patient and friends.

The number of cases available for this purpose is 892, of which in 204 no reference to heredity is made on the out-patient letter. It is not improbable that this number may include a few in which there was a history to be made out; but it is most likely that the necessary questions had been asked at the time of making the note, but that the negative point had not been recorded. In calculating percentages, these 204 cases have been regarded as those in which no family history was obtainable. It is probable that the error introduced is not a very serious one. With this reservation, then, we find that of the total number, 892, a family history of some sort or other is recorded in the notes of 223 males, or 25.6 per cent., and of 238 females, or 26.6 per cent.

First in importance come the cases in which a family history of nervous disease was made out. The majority of writers include under the term "neurotic heredity" epilepsy and other convulsive affections, hysteria, insanity, and chorea. It is quite

obvious that these terms cover a vast range of widely different conditions. The name epilepsy itself in the mouth of the public is a very loose one. St. Vitus' dance has a more fixed meaning. Paralysis is sometimes included; but, as a rule, paralysis means cerebral hæmorrhage or thrombosis, which is not a nervous disease, but a local expression of a general arterial degeneration. The term may, of course, in a few instances, refer to general paralysis, but it is most likely that these would be returned under the head of insanity. Under neurotic heredity, then, we include—(1.) epilepsy, ascertained; (2.) "fits," a looser term to be used when more exact information is wanting; (3.) insanity.

The true ascertained epileptics in the families of patients are necessarily few, including generally cases actually attending the Hospital. They number only 22 in all, equally divided between the two sexes. They have been, therefore, included under the more general head of "fits." Of these we find 96 males in 892 cases available, or 10.7 per cent., and 106 females, or 11.8 per cent.—making up a total of both sexes of 202 cases, or 22.5 per cent.

The number of instances of heredity of insanity is small: thus, 23 males, or 2.5 per cent., and 10 females, or 1.1 per cent., with a total of both sexes of 33, or 3.6 per cent.

Taking, then, all the cases which may be said to possess a neurotic family history, we find, by combining the above figures, 119 males, or 13.3 per cent., and 116 females, or 13 per cent., making up a total of both sexes of 235 cases, or 26.3 per cent.

It will thus be seen that if we judge of neurotic heredity from hospital experience, the tendency is to underrate its significance. This is probably due to the fact that persons of the class which make up the bulk of our Hospital patients really do not know much about their relations. In the earlier editions of Dr. Gowers' book on epilepsy, he records 35 per cent. as the percentage of epileptics with neurotic heredity; but in a recent article on the subject (Brit. Med. Jour., Sept. 1895, p. 774), he notes that, of cases seen in private of the upper and middle classes, he finds the percentage to be 48.8, or nearly half.

Unestimated, but probably the most potent, factors in the heredity of epileptics are alcohol and syphilis.

That the taint of rheumatism and gout may play a part in the ætiology of epilepsy has been hinted by some writers, but the figures have not been convincing. An inquiry into the family history as regards rheumatism and gout has been made as a matter of routine for some years, with the following result:—

Rheumatism, Acute and Chronic.—There was a family history in the cases of 87 men, or 9.7 per cent., and 102 women, or 11.3 per cent., making a total of 189 cases, or 21 per cent.

Gout.—This was recorded in the family histories of 28 men, an equal number of women, or 3.1 per cent., with a total of 56, or 6.2 per cent.

A family history of rheumatism or gout, taken together, was found in a total number of 245 cases, or 28.2 per cent.

It is a question whether these figures are of much value. It may be said that they are no larger than might be expected, considering the prevalence of the disease in this country.

Before leaving the subject of heredity, it would be of interest to consider the channel through which the hereditary influence is transmitted in the two sexes, *i.e.*, whether through father, mother, or both, or whether occurring in members of the same family, collateral, indicating a common but latent taint.

In the matter of "fits" we find, as follows, that the numbers are remarkably evenly distributed in the two sexes, but the tendency to inheritance is rather stronger through the maternal side. This is so slight that it would have passed without notice if Dr. Gowers had not found a similar tendency, amounting to 6 per cent.

	Males.	Females.
Through father	28	27
Through mother	28	31
Both sides	1	...
Collateral	28	22

In the case of insanity, the same tendency is shown, but the figures are too few to generalise from.

	Males.	Females.
Through father	5	1
Through mother	11	5
Collateral	4	1

Where there is a family history of rheumatism, we find that the hereditary influence is also rather more through the mother than the father.

	Males.	Females.
Through father	27	25
Through mother	30	32
Both sides	4	9
Collateral	5	12

But in gout, as might be expected, the paternal influence predominates, thus :—

	Males.	Females.
Through father	13	7
Through mother	3	3
Both sides	1	0

Results of Treatment.—It is almost impossible to give a report of the treatment of a disease by drugs which shall not be misleading. It is hoped, however, that errors may be reduced to a minimum by the method employed here. In estimating the effect of drugs upon epileptics, three important indications must be borne in mind :—1. The frequency of the fits; 2. the magnitude of the convulsion ; 3. the mental condition of the patient. The second indication deserves a word. It is usual to speak of fits as more or less severe, the measure of severity being the character of the convulsion, there being in the mind of the observer a sort of ascending scale of severity from *petit mal* to the typical general convulsion. But it must be understood that the magnitude or severity of the convulsion does not necessarily bear any relation to the severity of the disease as a whole, either from the point of view of treatment or prognosis. The worst cases are often those of the so-called *petit mal*, and those in which the convulsion is the most alarming are the most satisfactory to treat. On this point the out-patient notes must be very defective, owing to the varied standards of magnitude in the minds of the patients or friends.

In order that the reader may check the value of the following figures, it may here be stated that of the total number, 896, there have been rejected for the present purpose all patients who attended the Hospital for a period of under one year. This brings the available number of cases to 629, or 309 males and 320 females, of which 438 were still in attendance at the time of commencement of this article. It is not for a moment pretended that a year's observation is long enough to enable one to give a prognosis, but the same might almost be said of two or three years. It perhaps may be said roughly, that if a case is going to prove amenable to drugs at all, it will probably do so during the first six months.

In the table below, the years of attendance are divided into quinquennial periods, and, as might be expected, the numbers diminish greatly with each succeeding period ; but if considered by years, the diminution is very gradual.

Table of Period of Attendance.

Under observation for—	Males.	Females.
1 to 5 years inclusive . . .	220	223
6 to 10 „ „ . . .	70	62
11 to 15 „ „ . . .	13	27
16 to 20 „ „ . . .	6	4
21 to 23 „ „ . . .	0	4
	309	320

Average period of attendance, 2.3 years.

In estimating the effects of treatment, then, we bring the cases under the following categories:—

(1.) Those in which marked improvement has taken place. Among these are patients who have had no fits for many years while taking the bromides, but who, if the drug be dropped, soon have an attack. In such cases the mental condition is little altered, or, if at first enfeebled, regains under treatment its normal tone.

(2.) Those in which there has been an improvement, but much less pronounced than in the preceding class. Such patients cannot do without the bromides. It is true that their tendency is downhill, but the deterioration is markedly kept in check by treatment. They are perhaps the strongest witnesses to the value of the drug. Their fits are generally diminished in violence and in frequency, but there still remains the liability to slight attacks, so-called *petit mal*. They may degenerate mentally in the end, but there is reason to believe that this event is postponed by treatment.

Table of Results of Treatment.

	Males.	Females.	Total.	Percentage.
(1.) Marked improvement .	116	101	217	34.4
(2.) Less marked improvement	81	92	173	27.5
	197	193	390	62.0
(3.) No improvement, but no great deterioration .	79	96	175	27.8
(4.) Steady deterioration under all treatment . .	33	31	64	10.1

Reference to the table shows that these two classes make up the greater number of the cases, namely, 62 per cent., a large number of them being very old patients of the Hospital.

(3.) Those patients in whom no improvement takes place at all as regards frequency and magnitude of convulsion, and in whom mental degradation is very slow, nevertheless. Such cases seem to be unaffected by treatment, and they form 27.8 per cent. of the whole number.

(4.) Cases in which there is a steady downhill progress under any treatment. These are almost always patients with pronounced mental degeneration, who eventually gravitate to the insane asylum. These amount to the rather small figure of 10.1 per cent.

In the construction of the above table all cases have been excluded who had not been under observation for at least one year. As it might be suggested that this last group might be much larger if patients had continued to attend instead of giving up treatment in despair, an analysis is made of those patients who attended only for periods from two months to one year. It is of little value, of course, except that it seems, on the whole, not to alter materially the results of the last table.

Of these patients we have, after exclusion of a number who came but once to the Hospital, probably for an opinion only, 119 males and 131 females. Of these also a considerable number were still attending at the time of writing this article.

Table of Results of Treatment of Patients attending under One Year (many still attending).

	Males.	Females.	Total.	Percentage.
No fits since treatment . .	23	18	41	16.4
Fits fewer and slighter . .	52	65	117	46.8
No improvement . . .	31	36	67	26.8
Generally worse . . .	13	12	25	10

It will here be seen that the percentage of cases getting worse under all treatment is practically the same among those of inconstant attendance as among those who remained under treatment for long periods of time.

It is difficult to understand how persons suffering from so grave a disability as epilepsy, and receiving the striking benefit from treatment shown in the first group of this table, should cease to take advantage of it.

The drug treatment referred to in this paper is almost entirely that of the bromides. Rarely is more than twenty grains three times a day given, and generally ten or fifteen is found sufficient. After a time the patient learns the very least dose that will keep off the attacks, and in these a dose once a day, or

even in some once a week, seems to be sufficient to keep the balance. But among those cases in which the bromides appear to be of no benefit, a few seem to be remarkably improved by the use of borax.

If bromides be used with care, the object being to find the minimum dose, patients seem to bear the drug remarkably well, and, in fact, it becomes practically an article of diet with them, perhaps as much so as chloride of sodium is to the normal individual. Indiscriminate forcing of the dose, without benefiting the patient in the matter of his fits, generally adds to his troubles those of bromism, and in this connection it should be remembered that ten grains is to some persons what twenty grains or more is to others.

After making every allowance for inevitable fallacy in dealing with the above figures, and without taking too enthusiastic a view of the results of treatment, we are justified in encouraging patients to subject themselves to the prolonged, even life-long, influence of the bromides.

A REPORT ON

THE TREATMENT OF DIPHTHERIA BY ANTITOXIN AT THIS HOSPITAL.

BY

W. P. HERRINGHAM, M.D.

Since St. Bartholomew's Hospital can probably show as large a total of cases of diphtheria as any other general Hospital in London, and since Dr. Goodall's [1] are the only statistics of the new treatment yet published from any London Hospital, general or special, I have thought it a fitting task to set down the results of the serum injection upon our patients, feeling that all those who have learnt physic here look naturally to this Hospital for information upon such a question; that the Hospital's Reports are the fitting place in which to give the facts; and that to analyse such evidence from time to time and present it in these pages is probably as useful and as humble a work as the Medical Registrar can perform.

As all members of this Hospital know, our statistics must not be compared with those of other Hospitals without allowance; for our receiving officers are charged not to admit any cases of diphtheria but those whom it is dangerous to send elsewhere. If a case be not urgent, it is sent on to the Fever Hospitals of the Asylums Board. It follows from this, since urgency is almost always due to laryngeal obstruction, that our cases are almost all of them young. There are indeed so few over ten years old that they are merely irregularities, and I have for the present purpose taken those cases only which were under that age.

Next I must also state, that although in the cases herein comprised I have allowed no case which was not membranous —in which there was not membrane seen and noted — yet

[1] Clin. Trans., vol. xxviii. p. 61.

before the treatment by the antitoxin gave importance to bacteriological examination, our cases were not tested for the presence of the bacillus diphtheriæ.

Does this omission invalidate them for purposes of comparison? No; for though membranous sore throat and membranous laryngitis undoubtedly occur without the bacillus diphtheriæ, yet, judging by this year 1895, these cases are so uncommon here that they may be neglected. Of fifty cases admitted as diphtheria, only four failed to show the bacillus of Klebs and Lœffler, and of these failures one was owing to faulty inoculation of the tubes. Experience in other cities has been different, but to us our own alone is of account. In other respects the series are strictly comparable. The cases have all been treated in the same ward, have been under the care of the same physicians, and have been nursed by the same Sister. Nothing has been altered in the general conduct of the cases, or of the tracheotomy wounds, except this one thing, the injection of the antitoxin.

The cases that passed through my hands when Medical Registrar I have divided into two series, the first comprising all the patients treated during 1893 and the first part of 1894, the second those treated during the latter part of 1894 and the first half of 1895. The first were treated by older methods, the second by the injection of the antitoxin.[1]

I have reduced the gross numbers by eliminating both those who died under the operation of tracheotomy and those who died within twenty-four hours of admission. Within this space of time no treatment could be of much effect.

After this diminution, the first series comprises 95 cases with 50 deaths, a mortality of 52.7 per cent.; the second contains 50 cases with 8 deaths, or 16 per cent. A ninth case, admitted on March 8, had been running about the ward for four months with a tube in his windpipe, and unhappily died on September 16 of conditions connected therewith which will be detailed later. Another case, admitted on June 29, has been running about since the latter part of July, but is still in Hospital (October 12), as removal of the tracheotomy tube, repeatedly attempted, has always produced urgent dyspnœa. I have counted both these as recoveries from diphtheria, which they undoubtedly are.

These numbers are very favourable to the new method, but

[1] These are not selected cases, but are the first fifty, in order of admission, that were treated by the antitoxin; the first case was admitted on July 8, 1894, the last on July 29, 1895. All have shown the Klebs-Lœffler bacillus except the first three, which, by mistake, were not tested.

they are open to the objection that the cases of the second period may have been more amenable to treatment than those of the first. They may, for instance, have been admitted earlier in the disease, or they may have been older children, or, lastly, the receiving officers may, in the desire to use the new treatment, have admitted cases which were less urgent than usual.

I will compare the two series on these points, and first as to the date of admission.

Dating from the first symptom observed by the friends, there were admitted during the first period—

In the first three days of illness . .	21 cases.
From the fourth to the sixth day inclusive	35 ,,
Later than the sixth day	20 ,,
At an unknown date	19 ,,

Whereas during the second period the numbers are—

In the first three days of illness . .	27 cases.
From the fourth to the sixth day inclusive	9 ,,
Later than the sixth day . . .	12 ,,
At an unknown date	2 ,,

More than double the proportionate number were admitted during the first three days in the latter period, and so far the cases must be considered as more favourable for treatment.

Next I will consider the numbers at different ages. During the first period there were admitted—

Under 2 years of age . .	28 cases,	of whom 22 died.
Above 2 but under 5 years .	50 ,,	,, 26 ,,
,, 5 ,, 10 ,, .	17 ,,	,, 2 ,,

During the second period the numbers are—

Under 2 years of age . .	11 cases,	of whom 4 died.
Above 2 but under 5 years .	32 ,,	,, 4 ,,
,, 5 ,, 10 ,, .	7 ,,	,, 0 ,,

So that here again the second series has an advantage over the first in containing fewer yearlings. Yet we must allow that if the various ages be compared the mortality is enormously higher in the days before the antitoxin. And the same holds good even if allowance be made for the date of admission. For of the first series, the 28 cases under two years were admitted as follows:—

In the first three days . .	6 cases,	of whom 4 died.
From the fourth to the sixth day	11 ,,	,, 10 ,,
Later than the sixth day . .	4 ,,	,, 3 ,,
At unknown date . . .	7 ,,	,, 5 ,,

Of the second series, the 11 cases under two years were admitted as follows:—

In the first three days . .	8 cases,	of whom	1 died.
From the fourth to the sixth day	2 ,,	,,	2 ,,
At unknown date . . .	1 ,,	,,	1 ,,

And again, of the first series, the 50 cases above two but under five years of age were admitted as follows:—

In the first three days . .	12 cases,	of whom	6 died.
From the fourth to the sixth day	16 ,,	,,	8 ,,
Later than the sixth day . .	12 ,,	,,	8 ,,
At unknown date . . .	10 ,,	,,	4 ,,

While of the second series, the 32 cases above two but under five years of age were admitted as follows:—

In the first three days . .	15 cases,	of whom	2 died.
From the fourth to the sixth day	6 ,,	,,	1 ,,
Later than the sixth day . .	10 ,,	,,	1 ,,
At unknown date . . .	1 ,,	,,	0 ,,

Lastly, were the cases slighter in themselves? This is far the most difficult question to answer, as well as the most damaging criticism, if it be proved true. I know of no cardinal symptoms by which to judge between the two classes. The virulence of the poison is the most important feature in the case; and this, though it can usually be appreciated easily enough by the physician, yet does not reveal itself in the records afterward by the height of the temperature as in typhoid, or by the character of the rash as in malignant smallpox. Nor, I may add, could the physician himself class accurately each case in a long series, though he could always say whether this or that was a severe case or no.

Still, even with these drawbacks, one can by grouping the cases come to a fair estimate, and I shall accordingly compare first the cases in the two series in which there was nasal diphtheria; secondly, those in which the disease was both faucial and laryngeal, but not nasal; and thirdly, cases in which tracheotomy was performed. These are not mutually exclusive categories; but by looking at a building from many points of view we get a better knowledge of the whole, though we see the same parts more than once.

In the first series there are 39 cases of nasal diphtheria, of which 28, or more than two-thirds died. In the second, 12, of which 3, or one quarter died.

The disease attacked both the fauces and larynx, but not the nose, in 39 cases of the first series, of which 6 died, and in 20 cases of the second series, of which 4 died.

Tracheotomy was performed in 67 cases of the first series, of which 39 died,[1] in 32 cases of the second series, of which 6 died during the diphtheria, 1 died six months thereafter, and 1 is still wearing a tube three months after the operation. Of the 32, 1 case (recovery) was under twelve months, 4 (2 deaths) were over one but under two years,[2] 9 (1 death) were between two and three, 8 (1 death) between three and four, 8 (2 deaths) between four and five, and 2 over five.

However we group the cases, therefore, the mortality of the later period is very much less than that of the earlier.

But it has been stated that the antitoxin brings fresh dangers with it, and that it, or the serum which carries it, causes—

1. Eruptions on the skin.
2. Inflammation in the joints.
3. Albuminuria and nephritis.
4. Death.

Two cases have been published[3] in which sudden death appeared to follow serum injection. That among the enormous number of injections made, these two alone, so far as I can find, should have died thus, renders the connection between the two events very unlikely. No ill effects of the nature of collapse have been noticed with us.

Skin eruptions—erythema or urticaria—have occurred in ten cases, four of which were admitted near together, between the 7th and the 21st of June. In two cases the patients died, having a very severe form of diphtheria. One of them had a hæmorrhagic eruption also.[4] These cases will be detailed later. The other eight patients were hardly affected by the rash. In one case there was itching, and in another some fever coincided with the rash, but was fully explained by an abscess which was forming at the same time.

We have had no case of arthritis.

Albuminuria is, in my experience, so extremely common in diphtheria that it can hardly be more frequent under the new treatment. Of the 95 cases of the first series, 76 certainly had

[1] That 67 cases out of 95 should need tracheotomy will seem astounding until we recollect that urgency is nearly always caused by laryngeal stenosis, and that urgency is the qualification for admission here.

[2] But another case died six months later; *cp. infra.*

[3] Brit. Med. Jour., 1895, i. 987; Medical Week, 1895, p. 333.

[4] This must not be considered as an effect of the antitoxin. See a number of cases described by Austen and Coghill (Brit. Med. Jour., 1895, i. 694), of which the large majority were not treated by the antitoxin.

albuminuria, and two certainly had not; but in the remaining 17 cases the point has not been noted. Of the second series, 9 cases had none, in one case the point was not noted, and in the remainder albuminuria occurred. The proportion is almost exactly the same, four out of five in each series having the symptom. Of lasting disease of the kidneys, true nephritis, our few deaths do not permit us to speak; but on the one hand, all that we know would lead us to suppose that nephritis would vary with albuminuria, and on the other, Baginsky, with much larger numbers than ours, was able to say definitely that there was no increase of nephritis under the new treatment.

One may say, therefore, briefly, that there are no drawbacks to the treatment.

We have used several samples of the serum, Schering's (Aronson's), Ruffer's, Klein's liquid, and Klein's dried preparations. Our numbers do not enable us to compare the various preparations. The injection is usually made deep into the buttocks. The skin is first washed with $\frac{1}{20}$ solution of carbolic acid, and the syringe disinfected by boiling for a few minutes before it is used. The puncture is afterwards covered by a piece of isinglass plaster.

It has been stated that under the new treatment the local symptoms disappear more rapidly. I am sorry to say that I have not the means of comparing the two series in this respect. Of the cases in the second series, whose notes are exact upon this point, in 8 (3*f*, 1*l*, 4*f*+*l*)[1] the membrane had gone in three days from the beginning of treatment; in 7 (2*f*, 3*l*, 2*f*+*l*) the membrane had gone in five days from the beginning of treatment; in 8 (1*n*+*f*+*l*, 3*f*, 1*l*, 3*f*+*l*) the membrane had gone in eight days from the beginning of treatment; in 2 (2*l*) the membrane had gone in twelve days from the beginning of treatment; in 2 (1*n*+*f*+*l*, 1*f*+*l*) it lasted over twelve days; and one case died on the eleventh day with membrane still present over the soft palate, larynx, trachea, and bronchi.

I quote one case very remarkable in this respect:—

No. 45. (Dr. Gee) David B., 2 years 2 months. Had had measles lately. July 9, 1895—Sore throat; nasal discharge. July 11—Admitted on 3rd day. Ill-nourished, pale, and ill. Nasal discharge; continuous membrane over tonsils, uvula, and pharynx; no laryngeal symptoms; glands enlarged; a few scattered rales in lungs.

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[1] These cases are indexed as *f*, faucial only; *l*, laryngeal only; *f* + *l*, faucial and laryngeal; and *n* + *f* + *l*, nasal, faucial, and laryngeal. The date is the earliest at which all parts affected were clear, the nasal cases being judged by the cessation of discharge, the faucial by the disappearance of membrane, and the laryngeal by the cessation of excretion of membrane from the wound.

July 12.—Drowsy. Urine, a cloud of albumen. He remained the same till 15th. Same general state. Carboluria. The throat had been swabbed with a solution of carbolic acid, which was now omitted.

July 16.—Same general state; no albuminuria.

July 18.—A little better.

July 21.—Membrane has spread on to hard palate.

July 24.—Refusing food and vomiting.

July 25.—Better again; fauces unchanged.

July 30.—Pulse weaker; drowsy and prostrate.

July 31.—Brighter; pulse fair; fauces much clearer.

August 5.—Much better; fauces clear. Paralysis of soft palate, and absence of knee-jerks.

August 12.—Pulse irregular and intermittent, but much brighter.

August 21.—Cannot stand alone; knee-jerks absent.

September 1.—Discharged.

The temperature was irregular—occasionally very high (even up to 104.4°) up to the eighth day, July 18, then began to fall a little. From July 23–28 it ranged between 98° and 100°, and thereafter was usually about normal.

This child had altogether 122 ccm. of Klein's antitoxin. He was injected almost every day up to July 28th, and usually with 10 ccm. at a time; yet the membrane had not disappeared until between the 21st and 25th day after the injections were begun. There was only slight albuminuria, but considerable paralysis. The disease was confined to the fauces, pharynx, and nose.[1]

The fatal case will be quoted later.

In cases where operation was necessary to relieve laryngeal obstruction, tracheotomy has been the most usual means adopted. In twenty-five cases it was the only operation, and in these cases the tracheotomy tube was finally removed—

2	days	after	the	operation	in 2 cases
3	,,	,,	,,	3	,,
4	,,	,,	,,	6	,,
5	,,	,,	,,	1	,,
6	,,	,,	,,	1	,,
7	,,	,,	,,	1	,,
10	,,	,,	,,	1	,,
11	,,	,,	,,	1	,,
15	,,	,,	,,	1	,,
16	,,	,,	,,	1	,,
19	,,	,,	,,	1	,,

And 6 cases died wearing the tube.

[1] In this connection I quote the following from the first series of cases:—Alice Mary Y., 1 year 5 months. May 13, 1894—Croupy cough; nasal discharge. May 14—Hoarseness. Admitted on 2nd day. No nasal discharge; membrane on left tonsil; croupy cough; glands enlarged; much recession.

May 15.—Dyspnœa increasing. Tracheotomy. Membrane from trachea. Faucial membrane spreading.

May 16.—More membrane from trachea. This is the last time membrane is noted.

May 18.—Doing well. Tracheotomy tube removed. No albuminuria hitherto.

In two cases intubation was performed first, but had to be followed by tracheotomy. In three cases intubation was used after tracheotomy had been performed, to accustom the children to breathe through the larynx.

In only two cases was intubation used alone.

The difficulty with intubation has been that children cough up the intubation tube, and then turn black in the face before any one can get to them. One case, later than this series, had been treated by tracheotomy and then intubated. The tracheal wound had healed. One day he coughed up his tube, and had not the Sister herself reopened the trachea, would have lost his life. This sort of accident has created a feeling of insecurity, so that tracheotomy has in most cases been preferred.[1]

Its disadvantages, however, are well known, and I quote the following case as illustrative :—

No. 17. (Dr. Church) John James W., 1 year 11 months. Began to have a croupy cough on March 6, and was admitted March 8, 1895. Small, pale ; nasal discharge ; fauces swollen, no membrane ; stridulous cough ; enlarged glands ; much recession ; some bronchitis.

March 9.—Attacks of dyspnœa. Tracheotomy.

March 12.—Began to improve.

March 27.—Intubated.

March 29.—Tube coughed up, and for dyspnœa tracheotomy tube had to be hastily replaced. Several other attempts were made in which dyspnœa came on a very little while after the tube had been placed in the larynx. The trachea seemed to be so softened that the suction of inspiration flattened it, and so caused obstruction.

May 14.—Intubated again, and wore the tube until May 22, when it was thought safe to remove it. A few hours later urgent dyspnœa came on rapidly, and tracheotomy had to be performed for the second time.

July 14.—Intubated again, and various attempts were made to remove the intubation tube, but without success.

August 30.—The tube was coughed up, and urgent dyspnœa again supervened, necessitating tracheotomy for the third time.

The temperature had begun to rise on August 29. It became high and

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May 19.—Temperature rose to 103°–104°, and so remained for four days ; no cause known.

May 22.—Sudden syncope.

May 26.—Doing very well. Temperature natural. Urine, a trace of albumen.

May 28.—Doing well. Temperature occasionally a little raised.

June 4.—Up. Walking about. Wound healed.

June 6.—Temperature rose again.

June 11.—Measles rash. Much dyspnœa. Tracheotomy again.

June 15.—Doing badly. Membrane from trachea.

June 23.—Doing worse. More membrane.

June 24.—Died.

Post-mortem. — Membrane in larynx and going down into smaller bronchi. Kidneys natural.

Dr. Hayward had found the bacillus diphtheriæ in the first attack.

[1] Since this was written a child has actually died from this accident. The House-Surgeon reached the ward while the child was still alive, and did tracheotomy at once, but it only lived five minutes afterwards.

hectic until September 10, then high and level at about 102° F., until September 16, when the boy died.

Post-mortem.[1]—The wound involved the upper two or three rings of the trachea. Its edges were clean, and almost cicatrised outwardly, but internally the upper part was fringed by two large granulations disposed almost as a valve.

Below the wound, for about an inch, the anterior wall of the trachea is ulcerated, and at the lower end of the ulcerated path is a ring of scar tissue which considerably contracts the lumen.

Behind the pharynx, and rather to the left, is a cavity which can be tracked round under the sterno-mastoid. It looks like a drained abscess, but the drainage opening was not found, as the cavity itself was unsuspected until after the removal of the neighbouring parts.

Both lungs were generally adherent by recent lymph, and both contained extensive areas of broncho-pneumonia. The upper and middle lobes on the right side were practically solid.

The other organs were natural.

I give this case in full because it illustrates so clearly the three dangers of tracheotomy—(1) The valve-like granulations above; (2) the cicatrisation and constriction below; and (3) the softening caused by ulceration of the part between. It seems to me, however, that death was really due to a pyæmic condition, and to pneumonia, arising from the abscess, and therefore only indirectly to the tracheal obstruction.

The temperature in diphtheria is very variable. Looking over the charts to see whether the antitoxin seemed to affect the fever, I find them to fall into five groups.

(1.) Some cases have a temperature which, whether high or but moderate,[2] remains about the same for twenty-four or forty-eight hours, then falls rapidly to normal and so remains. Occasionally the fall begins even before twenty-four hours have passed. It is not so rapid as the crisis of pneumonia, and usually takes more than twenty-four hours to reach the normal. Of this there are eight examples; four were only faucial cases, two had slight laryngeal symptoms as well, and two required tracheotomy.

More commonly the temperature is very irregular, varying two degrees or more in the day. In some the rise takes place every day, and at the same time on each day, in which case the chart is like that of a hectic fever. But usually it is much less regular than this, and often shows no periods at all, or it is periodic for a few days and irregular thereafter. The hectic character seems to me accidental, and I have therefore classed these cases by the height to which they rise. Thus are formed two groups comprising—

[1] This and other post-mortem notes are copied from those of Dr. Tooth, the then Demonstrator of Morbid Anatomy.

[2] All cases in which the temperature rose above 101° I class as cases of high temperature.

(2.) Those with an irregular and high temperature, sixteen in all, whereof five came to the normal in five days, and eleven remained feverish for longer than five days.

(3.) Those with an irregular but only moderately high temperature, eleven in all, whereof seven came to the normal in five days, and four remained feverish for a longer time.

(4.) Some cases have a temperature above 100° F. Three cases fall in this class.

(5.) Three cases were of normal temperature throughout.

The first class is that wherein we might most suspect the effect of the antitoxin. The rapid fall looks much as if it was caused by treatment. But these charts are not peculiar to cases treated by this method. Five similar charts occur in forty cases treated without the antitoxin. We cannot therefore ascribe to it this rapid reduction of fever. Nor can the cases with no fever be caused by it, because they are afebrile when first admitted, and also because similar charts occur in the first series.

Therefore, I do not think that any effect upon temperature can be ascribed to the antitoxin. Very likely the varieties which I have described depend partly upon the number of microbes, or upon the kinds of microbes, combined with the bacillus diphtheriæ, but this I have not sufficient means to test. The variety of child is, I expect, in any case quite as important a factor as the variety of microbe.

The incidence of paralysis, a most important subject, has been treated by Dr. Hayward in a separate report appended to this paper.

The fatal cases were the following:—

No. 6. (Dr. Gee) Ethel H., 2 years 9 months.—September 21, 1894—Convulsions and vomiting. September 22—Sore throat and cough. September 28—Dyspnœa. September 29—Admitted on ninth day moribund from dyspnœa. Tracheotomy performed instantly; membrane coughed up; great relief. A well-nourished child. No nasal discharge; membrane on left tonsil and pharynx; enlarged glands; a cloud of albumen in the urine. Injected with ten minims of Schering's antitoxin nine hours after admission.

September 30.—Doing well. Nasal discharge; tracheal membrane coughed up.

October 1.—About the same; takes fairly. Faucial membrane less. Urine a cloud of albumen.

October 2.—Not quite so well, but takes well. Broncho-pneumonia. Still a little faucial membrane.

October 3.—Not so well. No faucial membrane. Died.

The temperature was high throughout.

There was no post-mortem.

No. 50. (Sir Dyce Duckworth) Henry A., 1 year 6 months.—November 15, 1894—Croupy cough; vomiting. November 17—Admitted on third

day. Small, weakly, ill-nourished, pale, and slightly dusky. Fauces natural; double respiratory stridor; recession of ribs; enlarged glands. Tracheotomy was performed directly. Schering's antitoxin ℥ix. injected eight hours after admission.

November 18.—Looks ill, but slept well and takes well. Some bronchopneumonia. Membrane, evidently from small bronchi, brought up. Schering's antitoxin, ℥iii.

November 19.—Died shortly after midnight.

The temperature on November 17, 6 P.M., 103°. November 18, 6 A.M., 100.6°; 6 P.M., 101.4°.

Post-mortem.—There is a considerable amount of membrane above the wound, and a thin coating of it goes all down the trachea, and is traceable into the smallest bronchi. There are patches of collapse scattered through the lungs.

No. 13. (Sir D. Duckworth) Frank S., 2 years 6 months.—December 28, 1894—Cough. December 29—Ill. December 30—Dyspnœa. December 31—Admitted on fourth day. Extremely ill; livid, very pale, very weak. No nasal discharge; membrane on left tonsil; inspiratory stridor; enlarged glands; much recession; urine a half of albumen Tracheotomy was performed at once. Klein's antitoxin, ʒiss. was injected at the same time.

January 1, 1895.—Very ill. Diarrhœa (eleven stools). Fauces as before; tracheal membrane coughed up. Erythema on chest. Klein's antitoxin, ʒiij. in two doses.

January 2.—Very ill. Diarrhœa (nine stools). Klein's antitoxin, ʒiss. Oxygen inhalations. Died.

The temperature was high throughout.

There was no post-mortem.

No. 18. (Dr. Church) David B., 1 year.—March 7, 1895—Drowsiness; dyspnœa. March 8—Nasal discharge. March 9—Difficulty in swallowing; vomiting. March 12—Admitted on sixth day. Well nourished. Pale. Pulse good; heart natural. Thick nasal discharge; membrane on fauces; no distinct laryngeal symptoms; enlarged glands. Klein's antitoxin, 4 cc. injected four hours after admission.

March 13.—No albuminuria. Antitoxin, 5 cc.

March 14.—Antitoxin, 5 cc.

March 15.—Urine a cloud of albumen. Nasal membrane came away. Antitoxin, 5 cc.

March 16.—Urine the same. Faucial membrane still.

March 20.—Urticarial rash, beginning at punctures in buttock and spreading all over trunk and limbs.

March 23.—Rash fading, leaving maculæ.

March 25.—Fresh rash all over body.

March 27.—Purpuric rash. Child doing badly.

March 30.—Losing ground. Heart's action very feeble. Signs of meningitis. Died.

The temperature was moderately high for five days, then fell to normal, but rose again with the rash, and remained high till death.

Post-mortem.—No membrane anywhere. Tubal nephritis. A softening clot in the appendix of the right auricle. Turbid fluid in the pericardium, in the peritoneum, and in the meshes of the arachnoid over the cerebral hemispheres.

Dr. Kanthack found—(*a*) in the original cultures, numerous bacilli diphtheriæ; (*b*) in cultures taken from the spleen diplo-, staphylo-

and streptococci; (*c*) in those from the puriform matter in the cardiac thrombus, diplococci in large numbers.

A case similar, as regards the post-mortem appearances, occurred in the first series.

No. 24. (Dr. Church) Edward B., 1 year 6 months.—April 3, 1895—Fever, cough. April 6—Croupy. April 7—Admitted on fifth day. Fairly nourished, pale, livid, much distressed, pulse feeble; no nasal discharge; membrane on left tonsil and pharynx; much recession; urine a cloud of albumen.

Tracheotomy the same day; a cast of the trachea and bronchi brought up. Klein's antitoxin 5 cc. injected two hours after admission.

April 8.—Very ill, takes badly, restless, much dyspnœa.

April 9.—Died of exhaustion.

The temperature was very high.

Post-mortem.—Thick membrane all over fauces, and a thin coating over the trachea and bronchi.

No. 26. (Dr. Gee) Jane W., 1 year 6 months.—Previous history doubtful. Admitted April 18, 1895, with signs of broncho-pneumonia. No signs of diphtheria until—

April 24.—Nasal discharge; membrane over uvula and pharynx.

Antitoxin (obtained from Burroughs & Welcome) 10 cc. injected at 7 P.M.

April 25.—Very pale and ill.

April 26.—The same. Faucial membrane extending, nasal membrane seen. Antitoxin 10 cc.

April 27.—Antitoxin 10 cc.

April 28.—A little better. Faucial membrane less, nasal discharge less.

April 30.—Still very pale and ill, but better. Much nasal discharge; hardly any faucial membrane.

May 2.—Better. Much less nasal discharge, fauces clear. Vomiting began and continued until—

May 4.—Died.

The temperature was very high with the broncho-pneumonia, and high with diphtheria.

There was no post-mortem.

No. 39. (Dr. Hensley) Eleanor T., 4 years.—June 22, 1895—Dyspnœa, anorexia. June 23—Admitted on second day. Pale, not livid, pulse fair; a large patch of membrane on left tonsil, stridor and croupy cough; urine one-third albumen. Klein's antitoxin 10 cc. in two doses. Cyanosis and dyspnœa coming on, tracheotomy was performed; much membrane brought up from trachea.

June 24.—Looked dying. Much broncho-pneumonia. Antitoxin 10 cc. in two doses.

June 25.—Better; much less dyspnœa. Membrane on fauces and from trachea. Urine the same. Antitoxin 18 cc. in two doses.

June 26.—Better; no dyspnœa. Antitoxin 28 cc. in three doses.

June 27.—Much better. Still membrane on fauces.

June 28.—Antitoxin 5 cc. Broncho-pneumonia began again, and grew worse and worse until death. Faucial membrane was present up to July 2. On July 3 the urine was half albumen.

July 4.—Died.

The temperature was high throughout.

Post-mortem.—Powdery membrane still on soft palate, larynx, trachea, and bronchi. Lungs stuffed with broncho-pneumonia. The kidneys, natural to the naked eye, showed under the microscope isolated patches of parenchymatous inflammation.

No. 46. (Sir Dyce Duckworth) William C., 4 years.—July 11, 1895—Hoarse. July 13—Admitted on third day. Well-nourished, not prostrate, but rather livid; no nasal discharge. Membrane on both tonsils, soft palate, and uvula; laryngeal stridor; enlarged glands; much recession. Tracheotomy performed at once. Klein's antitoxin 5 cc. injected ten hours after admission.

July 14.—Fairly well, slept well; membrane coughed up. Antitoxin 18 cc. in two doses.

July 15.—Very bad night; repeated attacks of dyspnœa. Urine a trace of albumen. Antitoxin 10 cc. Died.

Temperature 102° F. on July 13; rose next day to 103.2°.

Post-mortem.—Trachea and bronchi full of very thick and very adherent membrane. Dr. Kanthack, from punctures made in the lung-tissue, grew almost pure cultivations of the bacilli diphtheriæ.

Of these cases one may say that case No. 18 died from causes of a pyæmic chararacter, not directly, though probably indirectly, connected with the diphtheria, but that the most part died directly from the diphtheria, whether from its local effects upon the respiratory tract, as Nos. 30, 24, 39, 46, and probably No. 6, or from its secondary effects upon the nervous system, producing diarrhœa and vomiting, as in No. 13 and 25. It is to be noted that in three cases (Nos. 6, 50, 46) the antitoxin was not injected until nine, eight, and ten hours respectively after admission. Such delay must be considered prejudicial to the patient's chances of life. For these fatal cases should not lead us to doubt the benefit of the antitoxin. Present opinion views it as a quantitative antidote to the diphtheritic poison; and if this be so, it is but reasonable to inject in occasional cases at all times, and perhaps in many cases at some times, so large a dose of poison as to overcome the amount of the antidote injected. After making all allowances, we must conclude that the mortality has been very largely reduced by the new treatment, and I think we can hardly over-estimate the debt we owe to the great pathologists who have given us this remedy, hardly value too highly the methods by which their evidence has been obtained.

BACTERIOLOGICAL INVESTIGATIONS IN DIPHTHERIA.[1]

BY

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AND

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The value of a bacterioscopic diagnosis in diphtheria is now generally recognised. It is often not possible to make certain clinically whether we are dealing with a case of diphtheritic or non-diphtheritic infection. As a matter of fact, there is no doubt that since the introduction of the platinum needle and culture tubes into the wards we have been taught to include under the term diphtheria cases to which older physicians would have refused to give that name. We must now unreservedly consider every case of tonsillitis, laryngitis, or sore throat in which the diphtheria bacillus is found to be true diphtheria. Clinically there may seem to be objections, or prejudices, but the combined experience of pathologists and bacteriologists has established this point to a certainty. Judging from our own practical observations at this hospital—these cover a large number of examinations—we have occasionally differed from the clinical diagnosis: in some cases a suspected diphtheria turned out not to be true diphtheria. It is interesting to note that in some of these the sore throat was soon followed by a rash which proved them to be either measles or scarlet fever, and in this respect we are able to confirm the observations of Dr. Klein and others, that a membranous tonsillitis at the beginning of an exanthematous fever (especially scarlet fever) is generally *not* diphtheritic. This is not an absolute law, and therefore we say "generally," for although

[1] The following conclusions are based on observations made on cases of diphtheria admitted or treated between January and November 1895.

we have no personal observations on the matter, both in scarlatina and in measles double initial infections are occasionally met with, *i.e.*, the child or patient becomes attacked simultaneously by the exanthematous fever and diphtheria. We have notes of one case of typhoid (Hannah Barkin, Elizabeth Ward, examined October 25, 1895) where diphtheria bacilli were found on the inflamed tonsils. This observation is of interest, since Conncilman and Williams have observed this association of diphtheria and typhoid fever more frequently than one would imagine, and they go so far as to suggest that the post-typhoidal nerve-lesions are really diphtheritic in origin. We cannot venture an opinion on this point, since besides this case we have examined only one other case of sore throat in typhoid fever (Porter, Rahere Ward, Dr. Brunton, examined November 7, 1895). Here the diphtheria bacilli were absent. The question is one of importance, and it would be advisable to have all throats of typhoid patients carefully examined, and if any inflammatory lesions are present, to have them tested for the presence of diphtheria bacillus.

After these few introductory remarks we shall begin with an account of the method pursued by us in the diagnosis of diphtheria, or perhaps more correctly in the eyes of those who are more guarded, of the presence of the diphtheria bacillus. Serum is generally recommended as the best-suited medium for the separation of this organism, the objection to agar-agar being that it allows so many other organisms to sprout up as well, as to make the finding of the diphtheria bacillus somewhat difficult to those not greatly experienced in the matter. Serum certainly favours the Klebs-Löffler bacillus more especially, and thus renders the diagnosis easier. The objections to serum are the difficulty of obtaining it, the trouble of preparing tubes, which in a busy and poor laboratory like ours is a serious question. We have, therefore, finally adopted the following medium, of which, after extensive experience, we speak highly. Ascitic, pleuritic, or hydrocele fluid is collected in clean (not necessarily sterilised) flasks, and allowed to stand overnight in a cool place to allow the sediment or blood to collect. The clear fluid is then poured off, and to each litre of it we add enough caustic potash solution (10 per cent.) to render it very distinctly alkaline, *i.e.*, on the average 2 cc. to each 100 cc. Thereby the albumin in the exudation fluid is converted into an alkali albumin, which, as is well known, will not coagulate on boiling. The alkaline fluid is now heated in the autoclave for two to four hours, in order to completely sterilise it: this prolonged heating under pressure is necessary, since these exudations frequently contain a most

annoying sporing bacillus which is surprisingly resistant to heat. Unfortunately prolonged boiling gives the fluid a dark colour, which, however, is of little consequence in the end.[1]

To the sterile solution of alkali albumin 1.5–2 per cent. of agar-agar (finely cut and steeped in water) is added, and the mixture heated for four to six hours till the agar-agar is dissolved: it cannot be heated too long. We then filter first through cotton-wool to remove the coarser impurities, and eventually through filter-paper. The filtrate consists of an agar-agar containing serum-albuminate, and when poured into test-tubes solidifies as a transparent brownish jelly, moist, firm, and smooth, which can be melted when required, and which, in fact, can be used as any ordinary agar-agar. The advantages of this medium are: (1) we are working with human material which obviously must form a more natural soil for pathogenetic organisms found in human tissues; (2) in a large hospital like ours, ascitic and pleuritic exudations can be readily obtained and turned to good purpose; (3) this nutrient medium is transparent and moist, and keeps much longer than serum; (4) it has a very marked selective influence on the diphtheria bacillus, preventing some organisms, such as staphylococci, often from growing at all, but always keeping them, and even the rank bacterium coli commune, in the background; (5) it can be melted, and if necessary poured into plates, in cases where the diagnosis is difficult. Since we have used this medium, we have found the diagnosis of diphtheria a comparatively easy matter, and considerable time is saved, since the colonies of diphtheria bacilli stand out prominently as large white spots amongst the much smaller contaminations.

For the purpose of separating the suspected bacillus three tubes are inseminated with a platinum loop directly from the tonsils or affected portion, or from the membrane, and we generally proceed in this manner. The platinum needle is charged with the material and then over the surface of the first tube three parallel streaks are made, and without recharging the needle three further streaks over the surface of the second and third tubes, so that in the latter tubes the material is considerably diluted. The tubes are incubated at 38.5° C. and examined next morning, when an opinion, positive or negative, can generally be given with some confidence, which chiefly depends on the neatness and steadiness of the inoculator.

Since January 1895 up to the time of writing (2nd of

[1] Since the above was written we have found that a clearer medium is obtained on working up the fluid as soon as it is obtained from the ward. The addition of glycerine (4–6 per cent.) and glucose (.5–2 per cent.) is also useful. A full account will soon be published by Messrs. J. W. W. Stephens and Wood Smith.

November) over 150 examinations have been made, and in the following lines we wish to disclose a few observations which to us appear to be of interest.

(*a.*) *Bacterial Associations.*—Almost always the diphtheria bacilli have been accompanied by other organisms, especially by streptococci and staphylococci. The latter were undoubtedly the ordinary white and golden pyogenetic staphylococci; the streptococci were not worked up, and therefore may have included other forms besides the pyogenetic species. Besides these cocci, sarcinæ and torulæ also frequently occur. Microscopically vibrios and spirilla were often noticed, but we have not been fortunate enough ever to obtain these in pure culture.[1] Bacilli are common associates of the diphtheria bacilli, and amongst these the most noteworthy forms are varieties of the ubiquitous bacillus coli communis. This organism, if carefully looked for, may be found in almost every diphtheritic throat, which is not astonishing, since it is an almost regular inhabitant of the mouth and of the air passages. We have never separated the Klebs-Löffler bacillus in a pure unmixed condition; sometimes it appeared in large numbers, at other times only a few colonies may be obtained on the agar-agar surface. Various writers have ventured to offer more or less dogmatic opinions as to the prognosis and severity of an individual case of diphtheria from these bacterial associations. According to some, *e.g.*, M. Roux, the presence of the streptococcus gives the case a worse complexion; while others, *e.g.*, Dr. Washbourn, regard a pure diphtheritic infection, unassociated with the streptococcus, as far more serious. From our own experience, we are unable to express a positive or negative opinion in either direction; but we strongly incline to the belief that, *per se*, a contamination by the streptococcus signifies no danger whatever, since we have not yet met with a single instance where this organism was absent. True, in some cases it was found in small numbers; but then it must be remembered what a diphtheria examination amounts to—it is no more than an examination of an extremely minute trace of material. Deucher, who investigated a considerable number of cases, has come to the same conclusion. Of course it is quite possible that the presence of streptococci renders the patient more exposed to the risks of secondary septicæmia, lymphatic or pyæmic infection. Actually, however, as the case stands, independently of any possible secondary infection, the concurrent existence of the

[1] Recently Dr. Klein and Mr. Wood Smith have succeeded, independently of each other, in separating the vibrio tonsillaris by means of this new serum agar-agar, an account of which will be published shortly.

streptococcus is of no moment as regards the prognosis or the course of the disease.

(*b.*) *Artificial Cultivation.*—On the surface of the agar-agar two kinds of colonies may be recognised, either larger opaque ones or smaller less opaque ones, resembling colonies of the pyogenetic streptococci. An attempt has been made to distinguish accordingly two varieties of the Klebs-Löffler bacillus. We find, however, that it is easy enough to change one type into the other, so that we cannot, on the face of it, use the appearance of the colonies on an agar-agar surface as a distinctive character. These differences are more or less accidental, and, judging from other organisms, must be regarded in that light.

It is customary with some observers to distinguish three varieties of diphtheria bacilli, according to their shape, viz., the short, the medium, and the long variety; and it has also been said "that the short variety is the least virulent, and that the medium variety is less virulent than the long" (Washbourn). This point, again, we cannot confirm, and we attach no importance to the shape and length of the organism as a guide for its virulence. In some of the worst cases the short bacillus has been found, and in some of the mildest cases the long variety flourished. Again, we have frequently found that on continued cultivation in the laboratory media a long variety may change into the short variety, and more frequently still, that a short variety generally changes into the long variety; and, at the same time, from being kept on artificial soil, it often loses in virulence, as tested on the guinea-pig. Moreover, the long variety may be converted into the short by cultivation in an atmosphere of hydrogen. Shape and length, then, signify little as far as infective power is concerned. Similarly it was thought at one time that there are two distinct forms of streptococci, the *longi* and the *breves,* possessed of different degrees of virulence; this distinction, however, proved to be erroneous. On one occasion two sisters were infected, one after the other; one was examined on June 7th, and long forms of diphtheria bacilli were found; the other was examined on June 8th, and short forms were present. Yet there was no difference in the severity of these two cases, and we must assume either that the sisters were both infected from the same source, or that one infected the other. In the case examined on June 7th but few streptococci were found; in the other they were numerous, which also shows how little importance we can attach to the number of streptococci present.

(*c.*) *Persistence of Diphtheria Bacilli.*—We have made but few observations as to how long the diphtheria bacilli persist in the

affected areas after the antitoxin treatment. This was chiefly due to the fact that but rarely the cases were ordered to be re-examined before being dismissed. We have, however, a few notes on this point, and from experience gained more recently we feel that we must emphasise the importance, generally recognised by bacteriologists and pathologists, of having every case examined before it is sent out of the ward. The child may have been successfully cured, yet diphtheria bacilli may still be present, and thus this child may prove a danger and source of infection for others with whom it comes into contact.

A boy (Henry Large) was examined first on August 26, 1895, and diphtheria bacilli were found. Under serum treatment the symptoms and lesions soon disappeared, yet on the 12th of September, and again on the 23rd, *i.e.*, fully four weeks later, numerous diphtheria bacilli were still found. Another case was for the first time examined on October 12; bacilli were still obtained in large numbers on October 29 and November 2, and had not disappeared till November 9. Similarly, W. Haskett showed diphtheria bacilli on October 10, and after treatment they were present in large quantity on November 2, not disappearing till November 9.

The observations prove that in some cases the diphtheria bacilli persist and remain alive for a long time in the affected regions, in spite of the curative serum, and the lesson which we derive from them is that a vigorous antiseptic after-treatment is highly advisable, in order to clear the throat from the infective germs. In some cases it must be stated the bacilli disappeared within a week to ten days after the injections of serum. Nevertheless we cannot but feel that over the new remedy the older local treatment has been undeservedly pushed into the background, and we recommend its reinstatement either as an accessory treatment or as a form of after-treatment. No harm can possibly be done thereby, and it seems to us to be a rational and logical line to take.

(*d.*) *The Distribution of the Diphtheria Bacilli in the Tissues.*—Recently we have begun to pay special attention to the distribution of the Klebs-Löffler bacillus in the tissues of those who have died from diphtheria. It is, of course, well known that diphtheria is not a septicæmia, *i.e.*, that there is not a hæmic infection, but occasionally diphtheria bacilli have been found after death in the lungs, for instance, and even in more distant organs. Such observations were made at the Johns Hopkins Hospital, but a systematic investigation so far into this question has only been made by Dr. Wright of Boston, whose conclusions agree with ours. Our own inquiries are yet limited, but never-

theless of sufficient interest to be given here, but it must be well understood that they are still preliminary, and that we reserve a fuller account for some future date.

We have found that cases with extensive formation of membranes which pass into the bronchi and their ramifications contain diphtheria bacilli in the lung-tissues in such quantity that it is easy by passing a small platinum loop into the lung tissues to obtain fairly numerous colonies of Klebs-Löffler bacilli on the surface of the serum or serum-agar-agar. In most cases cover-glass films made directly from a fresh-cut surface of the lungs, stained with gentian violet, show numerous diphtheria bacilli. It might be thought that the bacilli were situated in the bronchi and bronchioles, but paraffin sections, appropriately stained, show clearly that many of the lung-alveoli contain the diphtheria bacilli, so that we are actually dealing with a pulmonary infection, which frequently leads to a broncho-pneumonia, diphtheritic in nature. In some of these cases there is also a distinct fibrin net-work in the alveoli, so that we have an intra-alveolar lesion strictly comparable to a typical diphtheritic affection of the tonsil or larynx with membranes.

Now in cases even where the bronchi showed no naked-eye changes, and where the membranes did not extend beyond the evident seat of infection, after death diphtheria bacilli may be found in the lungs. These observations are of theoretical as well as of practical interest, since they show that the orthodox view that the broncho-pneumonic changes are due to streptococci is far from being uniformly correct, and although up to now we have examined only a small number of cases, we wish to emphasise the fact that the presence of the diphtheria bacilli in the lungs is commoner than is generally thought, at least in cases that end fatally. The practical importance of these observations is obvious, for if once the diphtheria bacilli gain a footing into the lung, they are placed in good condition for copious growth, which implies increased toxin formation. Hence we should advise in cases of diphtheria with broncho-pneumonia to push the antitoxin rather than to rest content in the contemplation that this complication is produced by streptococci against which the anti-diphtheritic serum is powerless. This is all the more worthy of careful consideration since in a certain proportion of cases we have found the diphtheria bacilli also in the spleen. It seems then that in some of the cases which have ended fatally the diphtheria organisms were attacking the tissues from several points. Further observations must prove whether we have studied so far only exceptional cases or whether what we have described is the rule. Unfor-

tunately it is only recently that we have become methodical, and hence the number of cases examined is still too limited; and what is more serious still, it is still more recently that we have included the spleen in this examination.

Altogether in seven fatal cases the lungs alone were examined, and in each instance diphtheria bacilli were obtained by means of cultivation and microscopic specimens. In four other cases the spleen as well as the lungs were examined, and of these two showed the presence of the bacilli in both the spleen and the lungs, while the other two contained them in the lung alone. As already mentioned, we intend to continue these observations.[1]

Two other curious cases should be mentioned here, as they throw some light on the distribution of the diphtheria bacillus. (*a.*) In one case of pharyngeal diphtheria, membranes were found after death on the gastric mucosa, which contained the specific bacillus. (*b.*) Another case (P. T. Hayman), admitted on account of diphtheritic ophthalmia, presented several membranous ulcers, more or less phagedænic in appearance, on the neck. All of these contained the Klebs-Löffler bacillus. This then was an instance of true cutaneous diphtheria.

(*c.*) *Diphtheritic Ophthalmia.*—We have had the opportunity of examining eyes for the presence of diphtheria bacilli on several occasions, and in all these cases they or similar bacilli were found. Eight cases altogether were examined; in five of these the diagnosis of diphtheritic membranous ophthalmia had been made from clinical features, and in all of these the true bacilli were found with great ease. The remaining three, however, caused us at first much trouble and difficulty, since these, from the clinical and any other point of view, excepting the initial bacteriological one, were certainly not diphtheritic ophthalmia. (1.) One of these was a case of membranous inflammation appearing after cauterising with nitrate of silver (Robert Frith, Ophthalmic Ward, April 1, 1895). On making cultivations on a serum-agar-agar tube, only three colonies appeared, and these were all bacilli resembling the Klebs-Löffler organism closely. (2.) The second case was that of a youth who developed a membranous ophthalmia after a lime-burn; the membrane was small, and constitutional disturbance practically absent. Bacteriological examination revealed the presence of a similar bacillus in such numbers as to make its separation easy. (3.) Lastly, there was the case of a man suffering from severe

[1] We now possess observations on eighteen fatal cases; diphtheria bacilli were found in the lungs in all of them; in twelve of them the spleen was also examined, and bacilli found nine times.

purulent ophthalmia; in the purulent discharge gonococci and diphtheroid bacilli were found by microscopical examination, and the latter were further separated by cultivation on serum-agar-agar.

Here, then, are three cases which clinically were pronounced not to be diphtheria, and where there was no history of diphtheritic infection, and which yet the bacteriologist, unacquainted with the clinical aspects, might at first sight have declared to be true diphtheria. Microscopically, and often also on artificial cultivation, the bacilli separated from these cases were indistinguishable from typical diphtheria bacilli, and animal experiments unfortunately were not made. We do not believe that in these cases we are dealing with true diphtheria bacilli, but rather with forms resembling them, which apparently are very common. They are at present under observation.

(*f*.) *Clinical Diphtheria.*—There are many instances of cases which "clinically" are not diphtheria, yet which, bacteriologically examined, show the presence of the diphtheria bacillus, that we must be careful as to what "clinically not diphtheria" means. This form of clinical experience is gained by observations unaided by the test-tube and the platinum needle, and the bacteriological pathologist knows that it occasionally leads to the inclusion of wrong cases and the exclusion of true ones. For the present it is safest to consider any morbid lesion which contains typical Klebs-Löffler bacillus to be one of diphtheria. There are several, if not many, forms of diphtheroid organisms, which, however, can be distinguished by cultivation from the true diphtheria bacillus, there being some difference, though occasionally very slight only.

"Clinically not diphtheria" was also a case of fibrinous rhinitis, whence a membrane was sent to us by Mr. E. Colby of Malton. Numerous diphtheria bacilli were seen in cover-glass specimens, and they were easily separated by means of cultivation. Gelatine cultures ($\frac{1}{6}$ of a tube) killed a big guinea-pig in thirty-six hours, producing a large swelling at the seat of inoculation. Here, then, the diphtheria bacillus undoubtedly was present, and, as a matter of fact, in large numbers. Similar observations on other cases of fibrinous rhinitis have been made by others.

It requires much more work and more extended observation before the final word as to the real significance of the Klebs-Löffler bacillus can be spoken. We must always remember that in the fauces and on the conjunctiva of apparently healthy and normal individuals diphtheria bacilli have been discovered. A few words on this subject may not be out of place, although

PSEUDO-DIPHTHERIA BACILLUS.

Described by	Koplik (second paper).	Fränkel.	Löffler.	Beck.	Abbott.
Morphology . .	Identical in form and size with virulent bacilli and characteristic stain	Identical with virulent	Somewhat larger than virulent bacilli, and more tending to produce swollen ends	Shorter, plumper bacilla as a rule, but some like virulent bacilli	Bacilli in three cases were identical with virulent forms; from one they were longer than the virulent average.
Growth in bouillon and reaction	Cloudy, less abundant growth in bouillon to which glucose has been added; bouillon alkaline after 48 hours	Characteristic	Similar to virulent	Quicker and more luxuriant in growth	Same as in virulent forms, except that the changes from alkaline to acid, and, later, back again to alkaline were more rapid than in the case of virulent bacilli.
Growth on blood serum	More luxuriant, opaque, and whiter growth	Characteristic	Similar to virulent	Somewhat more luxuriant, and of more yellow colour	Characteristic.
Growth on agar-agar	More luxuriant, opaque, and whiter growth	Characteristic	Colonies had a less jagged edge, and were of a whiter hue	Colonies less jagged on the margin, and of a more yellow colour	Two out of four characteristic, one more luxuriant, and one giving colonies with darker central portion
Frequency met with	In two following true attacks of diphtheria. For first three weeks virulent bacilli found, then for two weeks non-virulent forms	In a number of healthy conjunctivæ, and in some cases of mild tonsillitis, and with virulent bacilli in diphtheria	Once with virulent bacilli from a case of diphtheria	In 66 well children found in 22; in 41 non-diphtheritic inflammation found in 14, or in a total of 107 found them in 36. Also with virulent bacilli in diphtheria	Four times in 53 throats, some healthy, others the seat of non-diphtheritic moderately severe inflammation.
Opinion as to the nature of the bacilli	...	Believes the virulent and the non-virulent to be of the same species, and includes under non-virulent some causing local reaction	Believes them to be of a different species, but only to be separated by animal cultures	Believed that the non-virulent forms found by him were of a different species from the virulent, and were saprophytic in nature	In doubt. *Note.*—The bacillus growing more luxuriantly on agar-agar, gave a dirty brown growth on potato.

Described by	Von Hoffmann.	Roux and Yersin.	Martin.	Escherich.	Koplik (first paper).
Morphology . .	Some bacilli identical with those of Löffler, others were shorter, thicker, and more uniform in size	Majority identical with virulent bacilli; minority of shorter, plumper, and more uniform variety	Short, plump bacilli	Bacilli shorter and plumper, and more uniform in size. When a drop of bouillon culture is spread on a cover-glass, the bacilli are found to lie in parallel rows	Short, plump, and uniform in size. Take a more uniform stain.
Growth in bouillon and reaction	Similar to virulent	Characteristic, except for slight cloudiness; changes of broth were the same as in virulent forms, but somewhat more rapid	...	More luxuriant growth with tendency to cause cloudiness. When grown in neutral litmus bouillon the litmus turns blue after two or three days	More luxuriant, cloudy at first, afterwards clearing with abundant deposit; bouillon acid after 48 hours.
Growth on blood serum	Sometimes identical with the Löffler bacillus, again found in larger and somewhat whiter colonies	Same as in virulent	...	Fairly characteristic; apt to be more luxuriant and whiter	More luxuriant and spreading.
Growth on agar-agar	Grows more luxuriantly, and spreads more over the surface. May become of dirty brown colour in central part of colonies	Same as in virulent, varying within the limits noticed in different virulent cultures	More moist, luxuriant, and whiter. Grow at room temperature	Grows more luxuriantly, and spreads more over the surface. May become brownish in colour after some days	More luxuriant and spreading.
Frequency met with	In 45 throats, some healthy, and some the seat of non-diphtheritic inflammations, they were found in 26	In 104 healthy children's throats found 41 times: 10 adults once; in 6 mild throat inflammations twice	In quite a number of diphtheria cases running a mild course	In Munich in 2 out of 70; in Graz in 11 out of 250 healthy throats, and those the seat of non-diphtheritic inflammations examined	In four mild throat inflammations.
Opinion as to the nature of the bacilli	Is doubtful whether these non-virulent bacilli belong to the same species as the virulent, or whether they are of a different species	Believed the non-virulent to be of the same species as the virulent; they were simply an attenuated form	An attenuated form of the diphtheria bacillus	Believes that they have no relation to the diphtheria bacillus, and that they can be separated pretty accurately by cultural differences	Are of a different species from the Löffler bacilli.

we have hardly any personal observation bearing on this point. Hofmann in 1888 stated that he had found in the throats of individuals, who were either healthy or suffered from throat affections other than diphtheria, bacilli so closely resembling the Klebs-Löffler organism, that he was undecided whether they were really modified diphtheria bacilli or different species altogether. They generally presented some differences from the typical forms, and were, as a rule, not virulent. Roux and Yersin also discovered organisms in non-diphtheritic affections, identical in their characteristics with Löffler's bacillus, except in this point, that they are not pathogenetic to guinea-pigs. They succeeded in attenuating virulent diphtheria bacilli, but they failed in rendering non-virulent forms virulent. Nevertheless they regard the two forms as identical and belonging to one and the same species. Escherich, on the other hand, adheres to the distinct specificity of the two forms, both on account of morphological and bio-chemical differences. At the present time, then, there is some confusion as to whether diphtheria bacilli, non-virulent in nature, may or may not exist in non-diphtheritic throats, or whether these non-virulent bacilli are entirely different forms of organisms. These innocent types are all included under the name pseudo-diphtheria bacilli. To us it seems that, if we adhere to this unfortunate name, that two distinct types of pseudo-diphtheria bacilli have been described—(*a*) those which structurally and culturally appear identical with the Klebs-Löffler bacillus, and (*b*) those which with care can be easily distinguished by some few points. To make this clear we reprint in a re-arranged form a table (pp. 96, 97) from Dr. Biggs' "Report on Bacteriological Investigations and Diagnosis of Diphtheria" (Scientific Bulletin No. 1, Health Department, City of New York, 1895, p. 34). This dual conception of the so-called pseudo-diphtheria bacillus has rendered confusion worse confused, and we maintain that a bacillus which, by a careful examination, can be distinguished from the true forms is utterly disqualified to raise any doubt in our minds, or to be called a pseudo-bacillus. We have never had any difficulty in excluding those types which were not really identical with the genuine bacilli, and therefore we have but rarely registered the pseudo-bacillus in our notes. Yet we have in some cases, especially in ophthalmic affections, found bacilli agreeing in almost all respects with Löffler's organisms. Unfortunately until recently we omitted from pressure of work to test their virulence. This, however, has now been undertaken by one of us in conjunction with Dr. F. W. Andrewes; the results, however, are not yet ready for publication. Dr.

Biggs expresses the opinion that only those bacilli which actually differ from the true forms should be called pseudo-diphtheria bacilli. This is a matter of choice, but it gives an organism which differs as much from the diphtheria bacillus as the colon bacillus does from Eberth's bacillus, a name bound to create confusion. He considers all bacilli, whether virulent or not, which are identical, morphologically, biologically, or tinctorially with Löffler's bacillus, as true diphtheria bacilli, and if such are found in diseased throats, or in persons who have been in contact with true diphtheria, action must be taken, curative or preventive. This seems to us sound advice, but it must be clearly understood that the final word on the "non-virulent forms of diphtheria bacilli" has not yet been spoken, and that we must approach the whole question with an open mind, especially since we may come across cases where on artificial cultivation we obtain a number of typical colonies of which some are virulent, others not, so that, as Dr. Biggs says, "the absence of virulence in a culture derived from one bacillus is not sufficient to prove that cultures from other bacilli from the same case would not be virulent." We must leave this question, chiefly because we are utterly unable to make up our minds as to the full significance of these matters.

(*g.*) *Hæmorrhagic Diphtheria.*—Before concluding we must briefly describe some observations made on a case which died in the Hospital, and on which an autopsy was performed on April 1, 1895. This was a child admitted into Radcliffe Ward for diphtheria (David Burge). It was treated with Dr. Klein's antitoxin, and did well, till, while on the road towards recovery, it developed a hæmorrhagic rash. This was apparently an instance of so-called "hæmorrhagic diphtheria." The blood was examined just before death, and contained the pneumococcus. The examination post-mortem revealed (*a*) otitis media, (*b*) œdematous meningitis, (*c*) a large spleen, (*d*) a broken-down purulent thrombus in the left auricle. The result of the bacteriological examination was as follows: (*a*) ear—pneumococcus, staphylococcus, pyogenes albus and aureus, diphtheria bacilli; (*b*) meninges—pneumococcus, staphylococcus pyogenes albus and aureus; (*c*) spleen—pneumococcus in pure culture; (*d*) thrombus in heart—pneumococcus in pure culture. It is well known that the mortality of hæmorrhagic diphtheria, in spite of the antitoxic treatment, is appalling; in fact, the antitoxin does not affect it. We know of no accounts of a complete bacteriological examination of such cases. If we are permitted to judge from this one case, it seems that the appearance of the hæmorrhages and other fatal symptoms was due to a septicæmia,

a secondary hæmic infection—in this instance by the pneumococcus—against which the diphtheritic antitoxin, by virtue of its specific action, is naturally powerless. All cases of hæmorrhagic diphtheria should be examined *intra vitam* for the presence of organisms in the blood, and *post-mortem* for their presence in the tissues. The pneumococci, separated from the spleen, heart, ear, and meninges were extremely virulent, and killed mice, guinea-pigs, and rabbits in eighteen to thirty-six hours. No doubt other organisms besides the pneumococcus are also capable of causing a hæmic infection or septicæmia in diphtheria. To us this solitary observation on hæmorrhagic diphtheria seems to be of importance, inviting to further investigation and studies.

Such are, in short, a few selected points which a systematic bacteriological examination of diphtheritic lesions has revealed to us. It has been our object to give evidence as to the instructive usefulness, at least to ourselves, which may be derived from supplementing clinical observation with the results obtained by means of a platinum needle and a few test-tubes. True, our conclusions and contributions are not phenomenal or even extensive; it must, however, be remembered that the diphtheria examinations are only a fraction of the work of our young pathological laboratory, and also that the number of cases on which our studies are based is limited when compared with the numbers admitted to the fever hospitals. There is yet much to be done, and much can be done if clinical medicine and clinical pathology will only consent to work in harmony, the one assisting the other.

THE OCCURRENCE OF PARALYSIS IN CASES TREATED BY THE ANTITOXIN METHOD.

BY

JOHN A. HAYWARD, M.D.

With the object of making as complete as possible any future reports on the incidence of paralysis in cases of diphtheria admitted to Radcliffe Ward, and treated by the antitoxin method, I made arrangements in December last year to follow up and examine those patients who had not already been kept under observation in the Hospital for a period of more than six weeks.

Dr. Herringham has kindly allowed me the use of his notes in the series of fifty cases, and I am also indebted to him for permission to publish the results gained hitherto as an appendix to his own report.

No paralysis was observed in eight cases which terminated fatally, but only one of these was under observation for a sufficient length of time (six months) to exclude the possibility of its occurrence. In the remaining seven respectively death ensued within three weeks, and they are accordingly not included in this report. Eleven patients remained in the ward for more than six weeks, and it was not considered necessary to re-examine them after leaving the Hospital.

Thirty-one patients were discharged within six weeks, and these, with the exception of three who did not return for examination, and could not subsequently be traced, I have examined personally, and inquired fully into their history since their discharge.

Thus out of the fifty cases, forty are available for the purpose of investigating the incidence of paralysis after the antitoxin treatment.

Of the forty cases, definite symptoms of paralysis have been noted in only two instances. Both of these occurred in the ward.

1. Robert Burnham, $3\frac{1}{2}$. Admitted June 18, on eighth day of disease. Knee-jerks present. Membrane on fauces. Nasal discharge. Urine, $\frac{1}{3}$ albumen.

June 20.—Tracheotomy. Membrane coughed up until the 25th. A severe case with great prostration. Total antitoxin injected 130 cc. (Klein), distributed over eight days. Last injection on June 25. No antitoxin rash occurred.

July 19.—Palate paralysis. Leg paralysis. Knee-jerks absent.

August 3.—Ocular paralysis. Left internal strabismus.

August 26.—Squint had disappeared.

August 27.—Discharged. Knee-jerks not noted.

2. David Breen, $2\frac{2}{12}$. Admitted July 11, on third day of disease. Nasal discharge. Abundant and continuous membrane over tonsils, uvula, and pharynx. Urine, cloud of albumen. A severe case, noticeable for the great nervous depression, continued fever, and the length of time (27 days) during which the membrane persisted on the fauces. Total antitoxin injected 122 cc. (Klein), distributed over thirteen days. Last injection on July 28. No antitoxin rash occurred.

July 18.—Knee-jerks absent.

August 5.—Regurgitation of fluids through nose.

August 12.—Pulse irregular and intermittent.

September 1.—Discharged convalescent. Knee-jerks absent.

It is particularly interesting to note that of the forty cases the two in which paralysis occurred received by far the largest amount of antitoxin, distributed over the longest period.

The nearest approach is in the case of Ellen Herbert, $2\frac{1}{2}$, who received 35 cc. (Klein) + 18 cc. (Ruffer), distributed over eight days. Both were severe types of the disease, with nasal discharge, a large amount of albumen in the urine, great depression, and long-continued fever, and the amount and prolongation of the injections of antitoxin were in correspondence with the persistence and fresh formation of the membrane.

Contrary to what might perhaps have been expected, no rash occurred in either case.

Among the twenty-eight patients seen by me after their discharge from the ward, only one exceedingly doubtful case of paralysis was noted.

Lucy Kennett, admitted March 28, discharged May 2. In this case there was a history of occasional regurgitation of food and fluids after she left the Hospital, lasting for about one month. No history of squint, weakness of legs, or alteration in voice.

Unfortunately, she was not personally examined at the time, and the mother only remembered the symptom when pressed as to its occurrence, and after leading questions had been asked. "The child was so well that she took no notice of a little of her victuals coming back." When examined five months later, there was no trace of any paralysis, and the knee-jerks were brisk. Taking into consideration the history, the child, and the mother, I am disposed, on the whole, to think that the case for paralysis was not proven.

In all the remaining cases, neither by history nor examination was there any suspicion of paralysis.

Special attention was directed to any evidence of regurgitation of fluids, difficulty in swallowing, nasal voice, squint, or weakness of the legs, or inability to stand occurring with a definite onset; and the presence of any ocular paralysis, reaction of pupil to light and accommodation, movements of the palate, power of arms and legs, and condition of knee-jerks were investigated thoroughly in each instance.

In connection with this investigation I may mention that it was often very difficult to be certain about the knee-jerks, and one such examination in a restless or excited child is unreliable. In all the children under three years of age, and in many instances of those under five, no reaction of the pupil to accommodation could be elicited. The difficulty in concentrating the attention, the uncertain powers of fixation for near objects, and restless movements of the eyes and head, probably account for the failure.

No special precautions have hitherto been taken to investigate the occurrence of paralysis after diphtheria in a consecutive number of cases from Radcliffe, so that it would be fallacious to compare the 5 per cent. incidence in the antitoxin cases with that in a similar number picked out at random from the records before this treatment was instituted.

Reliable evidence from other sources is not forthcoming, general statements as a rule only being made. Thus, according to Gowers, the incidence of paralysis after diphtheria is 25 per cent., but no statistics are given.

Cadet-de-Gassewich mentions 128 cases in a series of 937. Osler states 10 to 20 per cent. Spratly (Trans. Internat. Med. Congress, 1881) mentions 130 cases, 13 deaths, and 2 cases of paralysis. Washbourn and Goodall mention 72 cases treated with antitoxin, of which six subsequently suffered from paralysis. Previously, in 797 patients not so treated, the incidence had been 13.7 per. cent. (Clin. Soc. Trans., vol. xxviii.). It is to be hoped that in the future a complete record of the

occurrence of paralysis in cases treated at the Hospital will be kept. A systematic inspection after discharge could easily be arranged, and in the great majority of instances I have found parents only too glad to bring up their children, and grateful for the attention thus shown.

Should this method be adopted, a sufficient number of cases could be collected to render reliable any statistics as to the influence of the antitoxin treatment on subsequent paralysis, and perhaps afford sufficient indication for its use in the treatment of the complication itself.

THREE CASES OF PRIMARY MALIGNANT DISEASE OF THE LIVER.

BY

A. A. KANTHACK, M.D., AND E. L. LLOYD.

Primary sarcoma and carcinoma of the liver are sufficiently rare to be of interest to the pathologist as much as to the practical physician. Three cases of primary disease occurred in the wards during the last twelve months, under the care of Dr. Gee, Sir Dyce Duckworth, and Dr. Hensley respectively, who have kindly given us permission to make use of them; and they form the subject of the following paper. We shall here consider merely the pathological aspect of the morbid changes in question, alluding to the clinical history in short terms. The origin of primary carcinoma is still a mystery. Carcinoma can arise only from pre-existing epithelium, and since in the liver we have three forms of epithelium, viz., (1) the hepatic cells, (2) the cubical cells of the bile-capillaries, and (3) the columnar cells of the larger ducts, a carcinoma may derive its origin from any one of these types of cells. Its appearance would, of course, vary accordingly. It is by no means easy, however, to say in all cases from microscopical examination where a growth began; this difficulty was experienced especially in two of the cases described. A systematic investigation into the nature of carcinoma of the liver is still wanting, and much confusion has been introduced into the whole matter by singling out the "endotheliomata" as malignant growths of a special type. Histologically an endothelioma is either a carcinoma or a sarcoma, and since the term leads to confusion, it should be banished altogether. Alveolar growth built up of true epithelial cells, grouped together without intercellular substance, is a carcinoma, while an infiltrating growth, neither alveolar nor tubular in its structure, composed of cells of the connective tissue type, is a sarcoma. Sometimes the diagnosis is difficult

between a sarcoma and carcinoma; then if secondary growths are present, these generally will throw light on the matter, and they should always be made objects of careful examination. We shall at once proceed to the description of our cases.

With regard to the methods employed a few words will suffice. The material was in all cases embedded in paraffin, and thin sections cut on the rocking microtome, fixed on cover-glasses, and then stained with either hæmatoxyline and eosine, or with alum-carmine. The latter reagent is especially suited for this kind of work, since being a delicate stain, it does not obscure the intercellular substance, and does not render the specimen so opaque as hæmatoxyline does.

Case I.—*Carcinoma of the Liver.*

Charles Ford, æt. 35 (Luke Ward, Dr. Gee, February 23–May 16, 1895, Medical Post-Mortem Register, xxii. p. 127).

Brief History.—For two weeks pain in liver region, weakness and cough.

On admission.—Wasted, jaundiced, dusky, prostrate; liver much enlarged, producing a swelling reaching 1½ inches below the navel on the right side, hard and irregular to the touch. A loud systolic murmur was heard over the left hepatic lobe, and less distinctly over the rest of the abdomen. No ascites. Nothing of special importance in heart or lungs. Urine jaundiced. The liver increased in size, and pulsation was felt. Hydatid or abscess being suspected, an exploratory operation was performed on May 14, which proved the disease to be malignant.

Autopsy.—Body wasted, general icteric tinge. The peritoneum contains a quantity of deeply bile-stained fluid. The liver was enormously enlarged, weighing 176 oz., and containing a number of deposits of all sizes, from that of a nut to that of an orange. The growths are of every consistence, from quite a soft, dark maroon-coloured hæmorrhagic substance to a whitish hard material. In some of the growths the centre is occupied by a greenish colloid material. The whole organ is deeply bile-stained, and appears to be pitted all over the section by probably enlarged bile capillaries, but the bile ducts are not markedly distended. The gall-bladder was enlarged, and "contained two or three nodules of growth fungating into the cavity, soft and hæmorrhagic like those in the liver." Hepatic duct distended. No constriction of the

common duct was found. The abdominal lymphatic glands were all occupied and enlarged by new growth, so as to form a large lobulated mass.

Histological Examination.—(*a.*) *Under a low power* numerous alveoli are seen, mostly small in size, occupied by small cells closely packed together. The epithelium of the bile-ducts is proliferated, filling up the entire lumen of these ducts. At the margin of the nodule especially the bile-ducts show proliferative changes, so that we get the impression that the growth began in the smaller bile-ducts. This, however, may be merely an impression. The nodule is more or less clearly marked off from the unaffected liver tissue. The latter shows multiple hæmorrhages, and the nearer we get to the growth, the more destruction there is of the liver-cells, and the more abnormal the bile-ducts are.

(*b.*) *Under a high power* the cancerous nature is clearly made out. The changes described in the bile-ducts are more evident. It must, however, be remarked that some of the bile-ducts may be spurious productions due to the compression of the liver cells into cylinders and round cellular masses, resembling ducts in longitudinal or transverse section.

Again it must be conceded that the cells in the cancerous alveoli frequently are almost identical with those of the non-cancerous portion of the liver. It seems impossible to form a clear idea as to the origin of this growth.

The mesenteric glands are generally infiltrated, so that the true alveolar nature is almost lost, but where the structure is well marked, the cells in their arrangement agree very well with what was described in the liver.

Case II.—*Carcinoma of the Liver.*

Charles James, æt. 47 (John Ward, Sir Dyce Duckworth, May 20–June 2, 1895, Medical Post-Mortem Register, xxii. p. 136).

Brief History.—Quite well till four months ago, when he felt a tightness in abdomen, pain in back, and weakness of legs. Has been a heavy drinker.

On admission.—Liver greatly enlarged, reaching 1½ inches below the navel at the right side, and nearly as low on the left where it extends into the left lumbar region. Surface of liver felt quite smooth. No ascites. Heart and lungs show nothing of importance. No jaundice. The enormous enlargement of the left lobe and the perfectly smooth surface were remarkable.

While in the Hospital slight jaundice appeared. Vomiting came on, and the patient died exhausted.

Autopsy.—Heart and aorta, stomach and intestines normal. No ascites. Liver enormously enlarged, weighing 14 lbs. 2 oz. The enlargement was uniform. The surface was smooth, and presented a curious purplish-yellow mottling, Consistence soft and friable. On section the most marked feature is an enormous number of small yellow points projecting from the cut surface, resembling in places plugs of inspissated pus. In some places these are aggregated together, and the whole liver substance here looks softened and degenerated. These small yellow masses vary in size, from that of a pea to that of a pin's head. They shell out easily. They are more numerous by far in the left lobe than in the right. The intervening substance is friable, coarse-looking, and generally mottled. No enlarged glands found in transverse fissure. Portal vein patent. Ducts normal.

Histological Examination.—(*a.*) *Under a low power* the section shows numerous large alveoli, without any trace of fibrous capsule, imbedded amongst the remaining liver-cells. The alveoli are very irregular in shape and size. The smallest alveoli are not much larger than the blood-vessels in the portal canals, and are entirely filled up by small cubical or polygonal epithelial cells, which are nucleated, and are not separated by any intercellular substance. In the larger alveoli the central area is more or less free from epithelial cells, and is occupied by a granular *débris* containing a few nuclei. Glancing over the whole specimen, we are impressed by the peculiar distribution and arrangement of these epithelial masses. They seem to lie in spaces which might very well be lymphatic, or possibly biliary channels. In several places the alveolar structure is absent, and we have merely a more or less diffused epithelial infiltration. Cirrhotic changes cannot be detected with this power, but there are numerous small round cells scattered over the section, and also hæmorrhagic patches.

(*b.*) *The high power* makes the epithelial nature of the cells in the alveoli evident, and it confirms us in the supposition expressed above, that either the lymphatics or the biliary channels are occupied by cancerous growth. Cirrhotic changes are absent, but here and there the alveoli show in their walls traces of fibrous tissue. The centre of the cancerous alveoli contains much fat and granular broken-down cell material. There is a large amount of hæmorrhagic effusion, both into many of the alveoli and into the liver substance outside.

As to the origin of this form of carcinoma, it is evident that it is primary in the liver, and therefore it may either have started from the liver-cells themselves or from the epithelium of the smallest bile-ducts, which is cubical and not columnar. It seems probable from the distribution of the cancerous deposits and the nature of the epithelium that the growth began in the smaller bile-ducts, because the smallest alveoli occupy the relations of these bile-channels, and the distribution is very like that of smaller bile-ducts. Moreover, the bile canaliculi show distinct proliferative changes, their lumen being entirely filled up by small cubical cells, very closely resembling those found in the cancerous alveoli. In some places we find long cylindrical spaces, partially filled by solid masses of small cubical cells, an arrangement recalling bile-ducts.

It is, of course, possible that the growth began in the liver cells themselves, but the differences between the liver-cells and these cancer-cells is so striking, and transitional forms so conspicuously absent, that this view does not appeal to us, so that, taking everything into consideration, we must decide in favour of the origin of this form of diffuse cancer from the small bile-ducts.

Case III.—*Sarcoma of the Liver.*

Eliza Sharpe, æt. 70 (Mary Ward, Dr. Hensley, January 28–February 9, 1895, Medical Post-Mortem Register, xxii. p. 34).

Brief History.—Pain round waist six weeks. Four weeks before admission sudden pain in right hypochondrium. Swelling, tenderness, and wasting noticed since. Occasional vomiting. Good previous health save for "bilious attacks."

On admission.—Wasted. No jaundice. Skin of abdomen and waist freely pigmented with dark spots about the size of a split pea, which she says have been there for years. Enlarged liver reaches downwards almost to Poupart's ligament, two inches to the left of the middle line, and backwards into the flank. Its surface is nodular. One mass, felt by patient, being soft and semi-elastic. Examination of heart and lungs shows nothing special. No further symptoms till death.

Autopsy.—In both lungs there are nodules of secondary growth as large as woodnuts, spongy in structure, hæmorrhagic and surrounded by an area of hyperæmia. One or two bronchial glands enlarged. The peritoneal cavity contained a quantity of blood-stained fluid; one of the œsophageal lymphatic glands is infiltrated with growth.

Liver.—The semi-fluctuating swelling in the right epigastrium

is a mass of growth occupying the right lobe, about as large as a cricket-ball. It is very adherent to the abdominal wall, soft and spongy in consistence. On section it shows multiple hæmorrhages into its substance, and in its centre are one or two loculi caused by local softening. The right lobe of the liver is elongated, so as to reach well below the umbilicus. It contains many secondary nodules of growth, from the size of a woodnut to that of a walnut. The gall-bladder is thickened, and contained many small cubical black stones. Its mucous membrane is ragged, with several growths attached to its extremity. Hepatic and common bile-ducts pervious. The portal lymphatic glands are infiltrated generally, and there is a large group of enlarged glands just above the pancreas.

Histological Examination.—1. *Liver.*—(*a.*) *Under a low power* we find irregular areas where the liver-cells have disappeared, and have been replaced by a cellular new growth, which is easily recognised as a mixed-celled sarcoma. The cells are separated by extremely little and very delicate intercellular substances. They vary much in size and shape, some being very large and irregular in outline, others smaller and spindle-shaped, and yet others round or oval. Here and there we can still detect remains of the liver-cells, sometimes fused together into indefinite masses almost resembling giant-cells. The nodules are not encapsuled, but clearly infiltrate the surrounding liver-substance. The sarcoma-cells pass in between the liver cells, breaking them apart, destroying and replacing them. Blood-vessels can be seen in the growth, yet there is no hæmorrhage in it, but around the growth there are areas which are hæmorrhagic, so that here the liver-substance is irrecognisable, and all that can be seen are large collections of blood in the shape of red corpuscles and leucocytes.

With regard to the bile capillaries, they seem rather conspicuous, although they are not enlarged or in any degree proliferated, but they are, wherever visible, surrounded by leucocytes. Around the portal canals this round-cell infiltration is also very marked, so that we must assume that inflammatory changes have existed in the neighbourhood of the biliary channels, an observation which is readily made in most cases of malignant growth in the liver.

(*b.*) *Under a high power* the nature of the tumour becomes still more evident. We notice that the sarcoma consists, as already mentioned, of cells, very irregular in size and shape, most of them round or oval. Here and there large cells with large nuclei, sometimes with several large nuclei, can be seen.

The intercellular substance is very delicate, and there is but little of it.

At the periphery of the nodule, where the growth is infiltrating between the liver-cells, the peculiar cellular changes described above are most beautifully made out, viz., the cell fusion and the nuclear changes.

The other points which could be recognised under the lower power are more clearly seen, viz., the hæmorrhages which have entirely destroyed the liver-cells, leaving simply the connective tissue framework, and the inflammatory changes around the smaller bile-ducts.

2. *Lungs.*—(*a.*) *Under the low power* a section through a nodule in the lung shows—

1st, Areas occupied by hæmorrhages and blood-clot.

2nd, Areas made up of sarcoma tissue.

Where the sarcoma tissue is found, there also we find in the midst of it hæmorrhagic areas.

The sarcoma has no alveolar structure whatever, and consists of cells which are of considerable size, some of which are gigantic, containing numerous nuclei; others not quite so large, containing a single large nucleus. The size of the cells is most striking. There is a fine delicate intercellular substance, more prominent, however, than in the liver. Where the hæmorrhagic areas are the sarcoma substance has disappeared, but for a few islets here and there. These islets consist of the same large cells already described.

The sarcoma tissue extends along the fibrous trabeculæ, and in one or two instances the tissue around the vessels is occupied by these cells. In a few other instances a lung alveolus is completely filled up by sarcoma cells, or its outline mapped out by them.

(*b.*) *Under a high power* we observe large oval or round cells, and also much larger cells, almost epithelial in nature, or even cells which we might almost call giant-cells, containing numerous nuclei resembling those previously described in the liver. These large cells are true sarcoma-cells. The nuclei of these large cells contain distinct vacuoles, sometimes a single vacuole with a central dark spot, at other times a collection of them which resemble what some observers would describe as parasites, psorosperms, or coccidia.

It is evident, however, that they are not parasites, because they appear best marked in the cells which apparently are most degenerate. They vary considerably in size and structure, and are not found in any of the small cells. They are almost certainly degeneration products.

The material at our disposal is not sufficient to warrant any generalisations. The interest is centred in the origin of the primary cancerous growths, and this point has not been cleared up by our observations. For this we must look to investigations extended over a longer period of time, and including a larger number of cases.

ULCERATION OF THE LARYNX IN THE COURSE OF TYPHOID FEVER.

BY

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An extreme diversity of opinion still exists with regard to the frequency of the occurrence, as well as to the nature of the laryngeal complications in the course of typhoid fever.

An opinion as to the relative incidence of these changes is not come to the more easily when we find that part of the evidence is based on clinical observation and part on post-mortem examination taken separately.

To add to the difficulty, some authors include any inflammatory change, while others confine their statistics to cases where there has been some loss of substance, and this in part will account for such widely different numbers as 1.8 per cent. (Libermann) and 47 per cent. (Vierordt). Rokitansky,[1] without giving figures, states, as the result of post-mortem examination, that laryngeal ulceration is frequent in typhoid fever, whilst Trousseau, on the other hand, judging from clinical observation, says that he had only met with two cases. Sir William Jenner, in his classical paper on typhoid and typhus, found in fifteen post-mortem examinations ulceration of the larynx in one and signs of inflammation in five cases. It is interesting and to the point, however, to note that of the twenty-three fatal cases of typhoid fever embodied in that paper, no less than seven had suffered concurrently from facial erysipelas, which was in two cases the immediate cause of death. So far as clinical observations go, no results are worth considering which do not include laryngoscopic examination. It is not, however, every one who has the necessary time, opportunity,

[1] Rokitansky: Handbuch d. spec. path. Anat., 1842, vol. ii. p. 26.

skill, and hardness of heart to examine typhoid fever patients systematically with the laryngoscope.

Schrötter,[1] who over a period of four years examined every case of typhoid fever in the Rudolph Hospital, Vienna, found only 3 per cent. with any affection of the larynx.

Taken with Rokitansky's experience in the same city, this seems to show a much greater incidence of laryngeal affections among the fatal and presumably more severe cases.

This paper is based on an examination of the post-mortem records of this Hospital during the years 1890–94, and up to October 1895.

During that period 61 cases of typhoid fever were examined, but in eight cases it is definitely stated that the larynx was not included in the examination. Of the 53 cases remaining, some loss of substance is noted in 14=26 per cent., a larger number, we venture to think, than most people in this country would have expected. Griesinger, it may be remarked, estimated this ratio as about 20 per cent.

In this place we shall restrict our attention exclusively to the laryngeal ulcerations, although we are quite aware that catarrhal and erosive inflammations and simple perichondritis, as well as tonsillitis, form special typhoid complications. These can be studied best in the wards; here we are dealing with the records of the dead-house.

It seemed to us that the best manner of coming to a definite conclusion with regard to the nature of these ulcers, *i.e.*, whether or no they are specifically typhoidal, is to consider in connection with the morbid processes of the larynx those occurring elsewhere, and especially in the intestinal tract.

(1.) *Situation of the Ulceration.*—As to the situation of the ulceration, most authorities are agreed that the tip and edges of the epiglottis and the posterior part of the inner surface of the larynx, in the neighbourhood of the processus vocales, are most commonly affected.

In our fourteen cases, the larynx was affected alone in seven cases; the epiglottis alone in four cases; both in one case.

In two cases ulceration of the soft palate or pharynx was associated with a similar process of the epiglottis.

It may be observed that Rokitansky mentions the interarytænoid region, the petiole of the epiglottis, and the false vocal cords as being distinctly favoured by typhoid ulceration.

(2.) *Associated Conditions found Post-mortem.*

(*a.*) *Lungs.*—In eight cases the lungs were congested or

[1] Schrötter: Vorlesungen über die Krankheiten des Kehlkopfes, 1892, p. 137.

œdematous. In one other case there was œdema with fluid in both pleural cavities.

In one case we find hypostatic pneumonia, and in another case one-sided turbid pleural effusion recorded.

In one case there was pleurisy with infarction, the patient having had also otitis media and pyæmia.

In one case we read of consolidation and breaking down (? gangrene) of the lung, with purulent pleurisy.

In one case only the lungs were natural.

It is striking how frequently pleurisy existed concurrently with the laryngeal lesions, viz., in four cases out of fourteen, and of special importance, as we shall see later, is the association with pyæmia and gangrene of the lung, so that we wish to draw particular attention to these points.

(*b.*) *Intestinal Ulceration.*—In eight cases the intestinal ulceration was extensive, in two cases limited, and in four cases healing was advanced.

This observation again is one of great importance, since some observers, amongst whom may be mentioned P. Koch,[1] maintain that these laryngeal ulcers are typhogenetic in origin, and assert that these lesions invariably appear during the acute period of the fever, *i.e.*, before healing commences. This is obviously an error, as our post-mortem records show.

When we come to the nature of the ulceration, opinions are still more divided.

Is the ulceration of the larynx which occurs in typhoid fever a specific part of the disease and typhogenetic, and if not, to what can we ascribe its occurrence?

The simplest explanation in support of the non-specific nature of the disease is that put forward by Dittrich[2] and accepted by Von Ziemssen. He believes that the ulcers are the result of pressure of the vertebral column on the parts affected, and are to be compared indeed to bed-sores. He points out that the other mucous membranes (excepting, of course, the intestinal) escape in typhoid fever. In this, however, he is mistaken. The situation of the ulcers at once puts this theory out of court, for even leaving the epiglottis out of consideration, the ulcers are on the internal surface, and not the pharyngeal surface of the posterior laryngeal wall, where they would be most exposed to pressure. A certain proportion, too, of the ulcers are limited to the surface of the true cords, where pressure is impossible.

Others, notably Rheiner,[3] while rejecting the purely "bed-

[1] P. Koch: Laryngotyphus. Internat. Centralbl. f. Laryngol., vol. i. p. 334.
[2] Dittrich: Die Perichondritis laryngea, &c. Schmidt's Jahrbücher, vol. lxviii. p. 52.
[3] Rheiner: Ueber den Ulcerationsprocess im Kehlkopf. Virchow's Archiv, v. 1853, p. 534.

sore" explanation, hold that in typhoid fever patients, with the resistance of their tissues lessened, small repeated injuries, such as the passage of food, the act of coughing, or even speaking, are sufficient to account for the lesions.

For this explanation, in a modified or expanded form, there is much to be said, and to it we shall return.

Before and in the early days of bacteriology the specific and typhogenetic nature of the laryngeal lesions was apparently accepted by the majority. Rokitansky, who was one of the first to uphold this view, bases his argument chiefly on anatomical grounds. The ulceration in the larynx, he says, affects the same structure, the adenoid tissue, as it does in the intestine, and he regards it simply as a specific part of a general disease. Of course, if this were true we ought to have some affection of these parts in every, or nearly every case, and we might expect to find it especially marked where there is much intestinal ulceration.

Regarding it even as only a rare accompaniment, we ought to find it at its height during the height of the disease, and its course should follow that of the intestinal ulcers. We have seen, however, that in two of our cases the intestinal lesions were only slight, and in four others out of fourteen healing.

But quite apart from this, a careful histological investigation of the mucous membrane of the larynx at various ages shows that, in the situations mentioned by Rokitansky, where the ulcers commonly occur, no adenoid tissue worthy of the name is to be found. To speak of lymph-follicles in the larynx as something constant is erroneous, and therefore Rokitansky's explanation must fall to the ground on anatomical reasons also.

Later observers,[1] relying more on the constant situation and anatomical characters of the lesions, and being unable to supply other adequate explanations, have upheld the view expressed by Rokitansky; and some have added the presence of typhoid bacilli in the secondary processes of the disease, *e.g.*, periostitis, parotitis, as an additional reason.

This last reason is a broken reed to lean upon. Our knowledge of bacteriology has not so far helped to decide the matter, and perhaps it is as well to say at the outset that any except very recent work in this direction is practically useless, owing to the difficulty which existed in former years of distinguishing between the typhoid bacillus and the bacillus coli communis.

The bacillus coli communis has been regarded until quite

[1] P. Bergengrün: Zur Aetiologie der Kehlkopfgeschwüre bei Typhus Abdominalis. Archiv f. Laryngol., vol. iii. No. 112.

recently as an inhabitant of the intestine, and its presence elsewhere taken to mean fæcal contamination.

In that belief, where the possibility of fæcal contamination could be excluded, an ordinary microscopical examination, or perhaps some incomplete culture experiments, have been regarded as sufficient to establish the presence of the typhoid bacillus.

We now know that the bacillus coli communis is one of the most widely-spread saprophytes, found everywhere, and almost constant in the air passages. This has been conclusively shown after long-continued observations by the Pathological and Public Health Laboratories of our Hospital. Any evidence brought forward as to the discovery of the typhoid bacillus in the laryngeal lesions of typhoid fever patients must be repeated by the light of our more recent knowledge before it can be accepted. Unfortunately, so far we have not had the much-coveted opportunities for doing this.

Moreover, in a great number of cases no organism resembling the typhoid bacillus has been found on examination. Eppinger[1] found pyogenetic cocci. E. Fränkel, too, succeeded only in cultivating pyogenetic cocci from the laryngeal ulcers. He is strongly of the opinion that they are due to a secondary infection of the larynx with organisms other than the typhoid bacillus, the soil having been rendered suitable by the depressed condition of the patient. Fränkel's observations have been confirmed by so careful a bacteriologist as Brieger.

Bergengrün[2] in a recent communication defends the theory of mixed infection, *i.e.*, that the body has been infected concurrently with the bacillus of typhoid fever and the pyogenetic cocci, and that the former prepares the tissues for the latter. He has, however, no bacteriological observations of his own to record, and his conclusions are based entirely on theoretic considerations, and on the bacterioscopic results of others, which, so long as the confusion between the bacillus coli communis and the bacillus typhosus has not been cleared away, we not only have a right to doubt, but are forced to put in question. Janowski[3] has recently attempted to throw some light on the nature and process of post-typhoidal lesions, and has come to the conclusion that the typhoid bacillus is capable of producing suppuration, either unaided or assisted by and assisting a pyogenetic coccus. But nevertheless we must ask for fresh

[1] Eppinger in Klebs' Handbuch der path. Anat., vol. ii.
[2] E. Fränkel: Ueber Abdominaltyphus. Deutsche Med. Wochensch., 1887, No. 6.
[3] Dmochowski and Janowski: Ueber die Eiterung erregende Wirkung des Typhusbacillus. Ziegler's Beiträge, vol. xvii. p. 222.

observations by competent pathologists and bacteriologists who are fully awake to the difficulties and importance of a certain diagnosis between two such similar organisms as the bacillus coli communis and the bacillus typhosus are.

Examination of the conditions most commonly associated in our fourteen cases post-mortem with ulceration of the larynx has shown, as we have seen above, a great variety. Before continuing the discussion of the causes of the laryngeal ulcers, we must briefly consider some of the clinical conditions accompanying these lesions.

1. The average age of the patients was 22, which is about the average age for all deaths from typhoid fever. The youngest was 4 and the oldest 53 years of age.

2. The mean duration of the disease at death was 33 days. The shortest duration 22 days. The longest 56 days (relapse).

3. In half the cases the patient suffered from diarrhœa. In one case there was much vomiting, and in two cases marked deafness.

4. The temperature in eight cases out of the twelve never rose above 103° for some time before death.

In none of these circumstances do we find evidence of any relationship to the laryngeal affection, with the exception perhaps of the mean duration of the disease at death. The thirty-third day is certainly a late period at which to find the disease still progressing, and this confirms us in our opinion that the laryngeal affection is not specifically caused by the typhoid bacillus.

There is one condition very frequently noted, which we venture to think of some importance. In nine out of the twelve cases where the clinical notes were obtainable, the tongue is described as dry and brown; in four it was fissured as well, and in one even bleeding. In two cases the condition of the tongue is not noted, and in one only is it described as moist. In seven cases delirium accompanied the dry and brown tongue.

In contradistinction, one may state that in Jenner's fatal cases, in one-third the tongue was moist throughout the illness. This condition of the tongue is not the result merely of high fever, and the fever was in most cases not high, but along with the delirium may be taken as an expression of the "typhoid" state.

We have here all the conditions favouring the production of the characteristic lesions. A patient the resistance of whose tissue is lessened by a prolonged and exhausting disease. A condition of the mouth and of the parts affected in which a deficiency of secretion leads to a drying up of what little there

is, leaving the epithelial surfaces covered by a dry crust in which the common micro-organisms of the mouth swarm. The act of swallowing is imperfectly performed, the movements of the tongue are deficient, and the mouth is not cleansed of food as in health. The removal of the dried secretion, as may be seen on the lips and gums, often leaves some loss of substance, some slight excoriation behind. No chain of circumstances could be imagined more favourable for the entrance and multiplication of the pyogenetic organisms which are always at hand.

We may assume that this condition of the mouth is accompanied by a similar state of things in the larynx, *i.e.*, the mucous membrane becomes dried, and is readily affected by even slight injuries, which may lead to an initial erosion which soon becomes converted into an ulcer. Naturally this would occur most frequently in those places where the blood-supply is most deficient, viz., at the tip and edges of the epiglottis and over the processus vocalis, where the mucous membrane is tightly fixed over the cartilage. This explanation is merely a modification of Rheiner's view, alluded to above. It cannot, however, explain all cases, since the conditions described just now are certainly not constantly associated with laryngeal ulcerations in the course of typhoid fever. At best they can be only predisposing factors, but where they occur they seem to be of more than ordinary importance, since they occur so frequently.

It is obvious that by a systematic cleansing of the mouth from food particles and the routine use of some antiseptic mouth-wash much might be done in the way of prophylaxis in such cases. That this benefit is not imaginary may be shown by the experience of E. Fränkel, who found the laryngeal complications much diminished in severity and in frequency after introducing this treatment. Undoubtedly the ulcerations must be caused by micro-organisms, and mostly, so far as satisfactory evidence goes, these belong to the group of pyococci. It is of course quite possible that in some cases the typhoid bacillus may be the direct cause of all the trouble, for we know that it may wander into the blood and cause endocarditis, for instance. All we maintain is that the evidence so far adduced, and so far as we are in possession of it, cannot and does not convince us. Complications in the shape of secondary infections are common enough in bacterial diseases, as, *e.g.*, a streptococcus infection in diphtheria, and for typhoid fever also Dr. Klein has described secondary infection of the blood bythis same coccus.[1] We incline, therefore, to the view that these laryngeal processes are due to

[1] E. Klein: Local Government Board Report. Supplement, 1893.

secondary infections by pyogenetic cocci, the tissues being predisposed by the disease itself, and in some cases also by local injury, the whole mechanism being comparable to the acute necrosis or osteo-myelitis of bones which occasionally complicates acute fever. Here also we have an infection of the osseous tissues by the pyogenetic cocci, the whole resistance of the body first having been lowered by the fever. In addition, however, we frequently have also a more direct local predisposition which finds its cause in injuries, often slight in nature, of the limb. The cases seem to us to be parallel. In the case of osteo-myelitis there is some difficulty in explaining the paths of access which the organisms obtain; in the case of laryngeal ulceration no such difficulty exists. To speak of "mixed" infection in this connection appears to us to obscure matters, for it is a fresh infection of a debilitated subject by a fresh organism, or in rare and doubtful cases by the same organism. Recently we had the opportunity of examining six cases of post-typhoid suppurative lesions, and in none of them did we find the typhoid organism. In one case there was a bacillus which on gelatine grew exceedingly like Gaffky's bacillus, but subsequent study showed that it certainly was not. The publication of these cases we must leave for another year.

PRIMARY SARCOMA OF THE VAGINA IN CHILDREN.

BY

D'ARCY POWER.

I propose to deal briefly in the following paper with a small and rare subdivision of a large and common form of disease. Cancer of the generative organs in women is so frequent, and has been so thoroughly studied, that it would be difficult to say anything new about it until its cause is discovered; but cancer is not the only form of malignant disease to which these organs are liable. Sarcoma may and does affect them, and of sarcoma we know but little in this country. Dr. Gow contributed a useful paper upon the subject to the twenty-seventh volume of these Reports, but he dealt with it only as it occurs in the adult. I have recently had under my care a child who died from the effects of a primary sarcoma of the vagina. The case was an interesting one, and it led me to look at the literature of the subject, with the results which are here given.

D. M., aged 2 years and 4 months, was admitted into the Victoria Hospital for Children under my care in May 1895 with a tense swelling in the vagina, causing retention of urine. Fourteen months previously she had an attack of measles, followed by a purulent vaginal discharge. The discharge lasted for some months and then ceased. It was noticed again at Christmas, when it was accompanied by severe bearing-down pains. The practitioner who attended her, observing that the vagina contained polypi, applied a curette to the mucous membrane upon more than one occasion, a proceeding which, the mother says, was very beneficial to the child. The discharge however continued to be purulent.

The patient appeared to be in her ordinary health, and was running about until May 20, when she began to strain and retch. She passed water on the morning of that day, but not afterwards. The retching continued throughout May 21, and

it was especially severe when any attempt was made to feed her. There was much abdominal pain, which the child endeavoured to relieve by lying upon her belly. The pain and straining continued throughout the day of the 22nd inst., and the abdomen was then found to be full and hard. No water had been passed for forty-eight hours, and as a catheter would not enter the bladder, half a pint of clear urine was drawn off by puncturing it above the pubes. There was no trouble in defæcation, either now or at a later period; indeed throughout its illness the child had a tendency to diarrhœa.

The patient was received into the Victoria Hospital late in the evening of May 22nd, and a note made by Dr. Chaning Pearce, my House-Surgeon, states that "the patient is plump and healthy-looking. She lies sleepily with her legs drawn up. The temperature is 99.2° F. The abdomen contains a large and tense tumour, shaped like a pear. It is dull on percussion, and it extends upwards midway between the ensiform cartilage and the umbilicus. It is quite symmetrical, and is almost certainly bladder. The point of suprapubic puncture is clearly visible about an inch above the pubes. The labia are large and thickened. The entrance to the vagina is blocked by greyish masses resembling œdematous granulation-tissue. These masses feel hard and bleed slightly when they are touched. There is a little purulent discharge from the ostium vaginæ. Digital examination reveals the presence of a new growth in the vagina. It is attached to the right side and to the posterior wall of the canal. The small polypoid masses at the entrance to the vagina are wholly distinct from this larger tumour. The large tumour is firmly adherent to the vaginal wall, and it extends upwards as high as the finger can reach. It is cylindrical, and it is densely hard. The vagina is very capacious, and it is so long that the os uteri can only be touched with difficulty. The mass felt through the rectum is diffuse, and it clearly infiltrates the recto-vaginal septum. It is so thick at its highest point that the rectum is flattened between it and the promontory of the sacrum. A mass of scybala lying in the left iliac fossa can be felt through the abdominal walls.

"The orifice of the urethra is situated high up on the anterior wall of the vagina. A catheter was passed into it easily whilst the child was under chloroform, and six ounces of normal urine were drawn off. The pear-shaped swelling still remained in the abdomen even after the urine had ceased to flow. It was dull and resistant, but it was much less tense." The bladder was again found to be distended early in the morning of May 23rd. Ten ounces of urine were therefore drawn off, but the bladder

was paralysed, for pressure had to be exerted upon the abdominal walls before any urine would flow. When all the urine possible had been withdrawn, a soft mass which hardly fluctuated remained behind and extended as high as the navel. The catheter was tied into the bladder, and urine continued to dribble away for the rest of the day.

I saw the child for the first time at 3 P.M. on this day—23rd May—and satisfied myself that she was suffering from a sarcoma of the vagina, though I thought the growth had probably extended into the bladder. The patient seemed to be exhausted, and I therefore postponed any detailed examination or operative interference until she should have rallied. Dr. Chaning Pearce observed, however, that she got steadily worse, and at midnight I was summoned to find her moribund with uræmic symptoms. She died about 3 A.M. on May 24.

I made a careful post-mortem examination thirty-three hours after death. The bladder filled nearly the whole of the peritoneal cavity, its upper border extending an inch and a half above the umbilicus. Its total length was six inches, and its greatest breadth was three inches and three-quarters. It was uniformly oval in shape, and was filled with clear urine. The walls were thickened in spite of their distension, but they were not congested, and the mucous membrane appeared to be perfectly healthy. The urethra was patent, and measured two inches in length.

The vagina was greatly dilated and much elongated. It measured along the posterior wall $3\frac{1}{2}$ inches in length, and it was $2\frac{1}{2}$ inches in its transverse diameter. Its mucous membrane was much congested. The middle and lower portions of the posterior wall were covered with a thick mass of pedunculated growths, some simple and gelatinous, whilst others formed solid and rounded masses possessing the characters of an ordinary sarcoma. Many of these denser masses were wattled like a cock's comb, and they were of about the same consistence. All the growths were covered with vaginal mucous membrane, and there was no ulceration except on the surface of those nearest the ostium vaginæ. The largest mass of new growth lay upon the right side of the vagina and almost entirely blocked the canal. It was sessile, and appeared to be continuous with the tissue forming the posterior vaginal wall. The posterior *cul-de-sac* was entirely free from new growth, and it was of considerable size. The uterus and its appendages were much congested. The uterus measured an inch and a half vertically. Its external os was so greatly dilated that it admitted a No. 9 catheter, which passed readily through the cer-

vix. The lips of the external os were represented by a thin membrane. A large mass of new growth, left untouched until the specimen was hardened, had displaced the rectum towards the left side.

The kidneys were congested, but I could not find any evidence of disease in them. The ureters were not dilated, and all the other organs appeared to be healthy. There were no secondary growths in any of the tissues, and the lymphatic glands were unaffected.

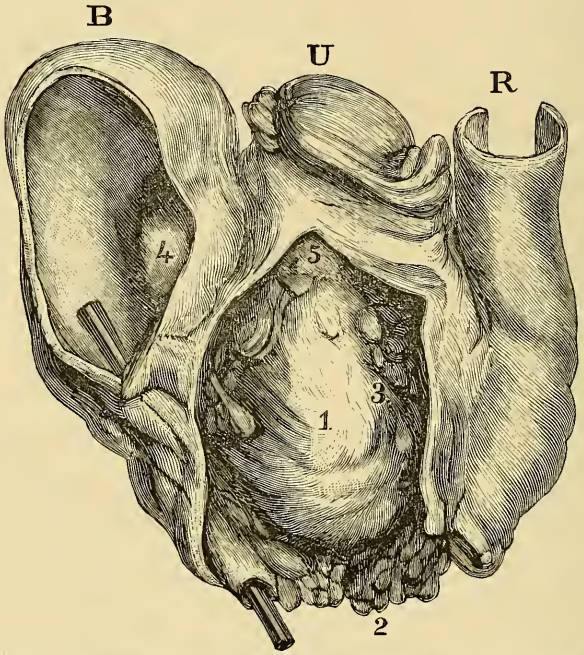

FIG. 1.—The pelvic organs of a child affected with primary sarcoma of the vagina. The dilated vagina is exposed by the removal of its left wall. A rod has been passed through the urethra. B. The dilated bladder. U. The uterus and its appendages. R. The rectum. In the vagina, 1 is placed upon the projection of the right wall caused by the mass of new growth seen in Fig. 2. This mass terminates at 5 as a lobulated growth situated just below the os uteri. 2. The polypoid masses at the ostium vaginæ. 3. The pedunculated growths at the upper part of the vagina. 4. The projection of the anterior *cul-de-sac* into the bladder.

The following account of the specimen is taken from the forty-seventh volume of the Transactions of the Pathological Society of London:—An examination of the specimen, hardened in Foa's solution and preserved in alcohol, shows that the bladder is enlarged, and that its walls are thickened by the hypertrophy of its muscular coats. The dilated vagina has projected

into the bladder just above the left side of the trigone (Fig. 1, 4). The vesical mucous membrane is perfectly healthy. The urethra is also healthy, though it is much elongated. It opens upon the anterior wall of the vagina somewhat higher than usual, and well above the point at which the vagina has been cut in removing the organs from the body.

The uterus is enlarged, but it does not seem to be diseased. The ovaries and the broad ligaments are healthy.

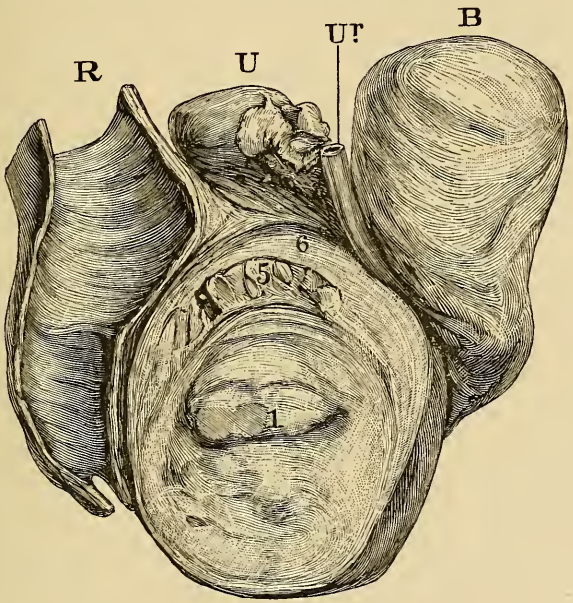

FIG. 2.—Sections through the right side of the pelvic organs from the same case as Fig. 1. R. The rectum. U. The uterus and its appendages of the right side. Ur. The right ureter embedded between the vaginal wall and the bladder. B. The bladder. 1. The circular mass of new growth projecting upwards at 5 to form a coronet of polypoid tumours which project freely into the upper part of the vagina. 6. The vaginal wall bounding the posterior *cul-de-sac*, which has been laid open in making the section, and is represented by the space between the rounded top of the new growth and the line marked by 6. The space is filled with the polypoid growth.

The vagina (Fig. 1) has been laid open by cutting away its left wall, which was covered with warty growths. The whole vaginal canal is enormously dilated, but its walls are not proportionately thickened. It is so pouched in its upper third that it projects into the bladder anteriorly, and into the recto-vaginal space posteriorly. It is divided vertically by a mass of new growth covered with normal mucous membrane. This mass projects from the right wall, and is more prominent at

the upper than at the lower part of the vagina. It is most prominent below the anterior lip of the os uteri, where it stands out as a lobulated mass like the wattles on a cock's comb. A longitudinal section taken through the preparation to the right of the vagina shows that this projection (Fig. 1, 1), which appears to be cylindrical in the vagina, is in reality the side of a circular mass of new growth (Fig. 2, 1) developed in the connective tissue on the right side of the vagina. It has grown until it has compressed the rectum on one side and the bladder upon the other (Fig. 2). This mass of new growth is still well circumscribed, except at its upper part (Fig. 2, 5), where it has become lobulated, to form rude polypi. The circumscribed portion of the growth is almost circular, and measures two inches across. It consists of more dense masses embedded in a soft gelatinous tissue. The right side of the posterior *cul-de-sac* of the vagina has been so greatly distended that a part of its wall (Fig. 2, 6) has been cut away in making the lateral section of the specimen, and it is thus seen how the polypi project into the cavity of the vagina. The right ureter is wedged (Fig. 2) into a narrow channel between the top of the growth and the base of the bladder.

The whole mucous membrane of the vagina is studded with hundreds of polypi, varying in size from the smallest pin's head to that of a large pea. The polypi (Fig. 1) are obviously of two kinds, some less numerous (Fig. 1, 2), sessile, and denser, the others more numerous (Fig. 1, 5), pedunculated, and gelatinous. The pedicles of the latter variety are often very long, and so slender that the polypi float freely in the vaginal cavity. They are very numerous about the ostium vaginæ, and again in the upper third of the vagina, where they are packed so tightly in the hardened specimen as to form a mosaic.

A microscopical examination of the vaginal wall shows that its serous and muscular coats are healthy. The submucous connective tissue is very soft and gelatinous. It is increased in quantity, and the thickening is not uniform. The submucous tissue is infiltrated with numerous small round cells, and aggregations of these cells covered with vaginal epithelium have grown into the lumen of the vagina to form the soft gelatinous polypi, which are so conspicuous a feature in the specimen. Even the most rudimentary of the polypi thus formed have a constriction at the level of the vaginal mucous membrane, showing that they would eventually have become pedunculated. They must be classed as myxo-sarcomata. The denser polypi, and the circumscribed mass of growth springing from the side of the vagina are small round-celled sarcomata,

containing a great deal of fibrous tissue. These denser masses are therefore rather of the type of fibro-sarcomata than of myxo-sarcomata. None of the growths examined contained striped muscle fibres in their substance, other than those which could be accounted for as belonging to the normal tissue of the parts involved.

I have been at some trouble to ascertain what other cases of primary sarcoma of the vagina in children have been recorded in England, in Germany, and in America. The following is a short abstract of such cases. I cannot hope that the list is in any way exhaustive, for many other cases must be buried in the files of the medical journals. I have been unable to discover any reference by French surgeons to primary sarcoma of the vagina in children, yet they must occur, and the condition is such a striking one that most of the cases should have been recorded.

Case 1. Our Museum contains (No. 3030) the earliest specimen of this interesting condition which I have been able to trace. It is described as "a large cluster of polypoi growths from the nymphæ and walls of the vagina of a child. The largest growth is of an oval shape, and measures nearly three inches in its chief diameter; the others are various in size and shape. Some are spheroidal, many are pyriform, and the smallest are not more than one or two lines in length. They are grouped without order. The largest is attached to the upper wall of the vagina and to the nymphæ, and its upper part is traversed by the urethra. The others were attached to different parts of the vagina. In minute structure all appeared to be composed of very fine fibro-cellular connective tissue: the largest was soft, elastic, and opaque white, the others were more like gelatinous polypi of the nose." At birth a growth like "a bunch of small grapes" was observed projecting from the vulva. It appeared to be connected with the right wall of the vagina, and was removed by ligature when the child was six weeks old. It was probably soon reproduced, but the next growth was confined to the vagina, and did not protrude until the child was three years old. A ligature was placed round its base, and it was allowed to slough away, but a fresh growth quickly appeared in its place. The mass preserved in the Museum specimen was removed six months after the second operation. The whole of the disease could not be removed, as some had to be left where it surrounded the urethra. A rapid increase took place at this point, and in about three months destroyed the child's life by exhaustion. The speci-

man has recently been examined microscopically, and it proves to be a sarcoma undergoing myxomatous degeneration.

Case 2.—The first recent case which I have found occurred in a girl aged fifteen years,[1] who was admitted into the Trier'schen Institute in Leipzig, under the care of Ahlfeld, in the year 1865. The patient had been ill a little more than a year, and the tumour had been noticed for a fortnight. The growth was removed in November, and the patient made a good recovery. It recurred, and was again removed in January 1896. The patient died of septic complications after the second operation.

Case 3.—Mr. Heckford [2] showed at a meeting of the Obstetrical Society the pelvic organs of a child aged two months. There was a great villous-looking tumour, apparently attached to the vulva. The growth extended inwards, and lined a large sac, which represented the enormously dilated vagina. Death took place shortly after the first appearance of the tumour. Microscopical examination "proved the growths to be medullary in their character."

Case 4.—A girl aged 18 months [3] was brought to Billroth's clinic on 22nd February 1873. Her mother had noticed a small tumour projecting from the vulva a month before she took her child for advice, but the tumour did not seem to have caused the patient any inconvenience, as she did not become really ill until a fortnight before Billroth saw her. The tumour was removed and the vagina was scraped with a spoon on 26th February 1875. Small nodules appeared at the orifice of the urethra on March 14th, and on the 15th there was retention of urine. The child died of peritonitis on the 18th. Dr. Kundrat, who was acting as Rokitansky's assistant, conducted the post-mortem examination. The mucous membranes of the bladder and of the vagina were found to be covered with warty papillæ, whilst the vesico-vaginal septum was infiltrated with a dense new growth. The new growth was a fibro-sarcoma.

The rapidity with which sarcomatous tissue is formed was well shown in this case, for the vagina had been thoroughly scraped with a sharp spoon a little more than a fortnight before the child died, yet at the post-mortem examination its mucous membrane was covered with polypoid masses.

[1] Archiv f. Heilkunde, 1867, vol. viii. p. 560.
[2] Trans. Obstet. Soc., vol. x. 1868, p. 224.
[3] Wiener Klin. Woch., 1889, No. 8, p. 159.

Case 5.—Mr. Howard Marsh[1] recorded a case of polypoid growths of the bladder and vagina in a child aged two years, who had been under his care at the Great Ormond Street Hospital for Sick Children. The child's mother had noticed that a fleshy-looking substance as large as a grape projected from the vagina when the patient was a year old. There was neither bleeding, pain, nor difficulty in micturition. The growth was removed by ligature. Similar growths appeared in the course of few months, and were also ligatured. There was eventually complete incontinence of urine, much straining, pain, and an offensive vaginal discharge. The child lost flesh and strength, the attacks of pain and straining became more frequent, and death took place sixteen months after the commencement of the disease. All the organs were found at the post-mortem examination to be healthy, except the bladder and the vagina.

The preparation excited considerable interest, and a report upon it was prepared and submitted to the Society by the Morbid Growths Committee. This report stated that the growths in the bladder "are limited to the base and neck, whilst those in the vagina are almost confined to the anterior surface, where it is in contact with the bladder. Between the bladder and the vagina is a dense and solid mass . . . which is nowhere sharply defined." Microscopical examination showed that the growth consisted of small round cells, with a basis of connective tissue. It was obviously a small round-celled sarcoma, but for some reason which is no longer apparent the Committee concluded its report with the singular statement that "there is no tissue present in any part of the specimen which may not result from a simple overgrowth of the normal tissues of the part."

Case 6.—Dr. Gaillard Thomas[2] had under his care a girl aged eighteen months, who appeared to have been in perfect health until three or four months previously, when a small tumour appeared on the left labium majus. The tumour, when he first saw it, was "as large as a hen's egg bisected lengthwise." The base of the tumour extended along the labium majus, and its highest point was attached to the edge of the urinary meatus. The growth was removed by the galvano-cautery. It grew again almost to its original size, and was removed a second time five months after the first operation. It recurred again,

[1] Trans. Path. Soc., vol. xxv. 1874, p. 178.
[2] American Journal of Obstetrics, vol. vii. p. 51.

sloughed, and the child died. Microscopic examination showed that it was a sarcoma.

Case 7.—Dr. Thomas C. Smith, of Washington, D.C., published[1] an account of a peculiarly interesting case, in which both the uterus and the vagina were stuffed with multiple mucous polypi and with sarcomatous growths. The child was aged three years and eight months. A tumour which appeared between her labia at the age of eight months was snipped off, and many similar growths were afterwards removed. The child died of exhaustion . . . months after the first tumour was seen. She had so much œdema that towards the last it was only possible for her to breathe whilst she rested on her hands and knees.

The post-mortem examination showed that the vagina was four inches long. Its walls were greatly thickened, and its mucous surface presented nodular elevations of various breadths, and polypoid growths of various sizes. The uterus measured $4\frac{1}{2}$ inches in length and $3\frac{1}{2}$ in breadth at the fundus. Its walls were firm, and apparently homogeneous in structure. The mucous membrane presented irregular nodules and a few small polypoid growths. Many subperitoneal masses were attached to its outer surface. Four months after its removal the uterus and its appendages weighed 31 ounces. Dr. Smith[2] in a subsequent communication adduced skilled evidence to show that the growths in this case were myxo-sarcomatous.

Case 8.—Hauser[3] saw a child, from the anterior wall of whose vagina sarcomatous tumours were first noticed at the age of six months. The growths occurred rapidly after they had been removed, and death took place about eighteen months later. The tumours consisted of round and spindle cells, and they contained smooth and striped muscle fibres, with islands of epithelium. The growth appeared to have begun in the anterior wall of the vagina.

Case 9.—Demme[4] records the case of a child aged $5\frac{1}{2}$ years, in whom the growths sprang from the posterior third of the right side of the vagina. The polypoid masses were excised, but they recurred five months afterwards. They were again removed, and returned four months later. The patient died, after numerous operations, when she was seven years old. The

[1] American Journal of Obstetrics, 1883, vol. xvi. pp. 555 and 668.
[2] Ibid., 1893, vol. xxvii. p. 577.
[3] Virchow's Archiv, Bd. lxxxviii. p. 168.
[4] 19te Jahresbericht d. Jenner'schen Kinderspitals zu Bern, p. 95, quoted by Pick, Archiv f. Gynäkol., vol. xlvi. p. 218.

primary and the recurrent tumours were fibro-sarcomata, which seemed to have originated in the right side of the vagina. They were first noticed soon after birth.

Case 10.—Steinthal[1] saw a child aged two years, from the anterior wall of whose vagina a tumour had been growing for eight months. The growth was removed, and recurred eight weeks later. It had then grown as large as a walnut, and it was again removed. Death took place from uræmia six months afterwards. The growth was a myxo-sarcoma.

Case 11.—Sänger[2] reports the case of a child who was aged two years and eight months when it was first seen to be suffering from a primary sarcoma of the vagina. There were numerous polypoid masses with broad bases of attachment to the anterior vaginal wall. The inguinal glands were affected. The tumours recurred very soon after they had been removed, and the child died at the age of three years and six months. It was then found that the bladder, the broad ligaments, and the deep lumbar glands were infiltrated by the new growth, which was a round-celled sarcoma containing a few spindle cells. The growth had an epithelial covering.

Case 12.—Ahlfeld[3] (*cf.* Case 1) saw a second case of sarcoma in a girl aged $3\frac{1}{2}$ years, whose vagina was filled with polypoid growths. The inguinal glands were greatly enlarged, and death took place on August 20, the child having been seen for the first time on July 26, 1876. The growth was a fibro-sarcoma filling the whole pelvis. It grew from the anterior wall of the vagina, and had so infiltrated its substance that the whole wall was greatly thickened.

Case 13.—A child aged $2\frac{1}{2}$ years was brought to Soltmann.[4] Her vagina contained racemose tumours, springing from the anterior wall and involving the bladder. Death was due to uræmia. The growth was of a year's duration. It was a round-celled sarcoma in the vagina, a spindle-celled sarcoma in the bladder.

Case 14.—Schuchardt[5] records the case of a child aged

[1] Virchow's Archiv, Bd. cxi. p. 449.
[2] Archiv f. Gynäkol., Bd. xvi. p. 58.
[3] Ibid., Bd. xvi. p. 135. An excellent bibliography of the whole subject of malignant growths as they occur in children is appended to this paper.
[4] Jahrb. f. Kinderheilk., Bd. xvi. p. 418.
[5] Verhandl. der Deutsch. Gesellsch. f. Gynäkol., 1888, Bd. ii. p. 239.

seven months, in whom a tumour grew from the right wall of the vagina. The growth was removed, but it recurred in the labia a fortnight later. The patient died five months afterwards, and the tumour was found to be a mixed-celled sarcoma of an angeiomatous nature.

Case 15.—Schuchardt[1] has also seen a second case of primary sarcoma of the vagina with polypoid masses springing from the mucous membrane. It occurred in a child aged $2\frac{1}{2}$ years, and the growth sprang from the posterior wall of the vagina. It protruded from the vulva when the child coughed. It was removed, and it recurred $6\frac{1}{2}$ months later. It was again removed, and Schuchardt returns the case as cured, for he showed the girl, fat and healthy, at the Halle Congress in 1888, two years after the last operation. The growth was a mixed-celled sarcoma, the isolated excrescences consisting of epithelium.

Case 16.—Volkmann[2] saw a sarcoma occurring primarily in the vagina of a child aged seven years. Recurrence took place two months after the first operation.

Case 17.—The same surgeon records[3] a similar case in a child aged five years. The swelling protruded from the vagina on coughing. The growth, with a piece of the vaginal wall, was removed in September 1885. Recurrence took place six weeks later, and for the third time, a fortnight after its second removal. The tumour was again removed, and with it more than half the posterior wall of the vagina. There had been no farther recurrence when the case was reported in May 1888. The new growth in both these cases was papillomatous; histologically they were both round-celled sarcomata. [The cases Nos. 16 and 17 seem to be the same as Nos. 14 and 15.]

Case 18.—Dr. Lewis Marshall of Nottingham[4] saw a child aged two years and seven months in whom the growth originated from the posterior wall of the vagina. It was removed, but soon recurred. The growth was again removed on May 16, 1881, the child died on May 24 of general peritonitis, which appeared to be quite unconnected with the operation. The autopsy showed that there was some suppuration round the left ovary for which no cause could be discovered.

[1] Loc. cit.
[2] Brit. Med. Journ., 1888, ii. p. 626.
[3] Loc. cit.
[4] Brit. Med. Journ., 1889, i. p. 127.

Case 19.—Schustler[1] records a case occurring in a child aged four years, who had enjoyed good health until four months before she was first seen. She then began to suffer from a purulent vaginal discharge, and two months later several small round tumours projected from her vulva when she cried or strained. These growths were removed, and digital examination of the vagina during the operation revealed the presence of a tumour on the anterior wall springing from the vesico-vaginal septum. This tumour afterwards ulcerated. It was removed, and proved to be a myxo-sarcoma. There was some dysuria, but no cystitis or retention of urine. Defæcation was performed normally.

Case 20.—Professor Weinlechner[2] had a child aged eighteen months brought to him at the St. Anna Children's Hospital in Vienna with a polypoid sarcoma of the vagina. The child died a fortnight after its admission to the hospital, but unfortunately the notes of the case are lost. The post-mortem examination showed that an ulcerating sarcoma had infiltrated the vagina, the urethra, the base of the bladder, and the uterine cervix. It had caused cystitis, pyometra, and pyelitis. The growth was papillomatous, and was a myo-fibro-sarcoma.

Case 21.—Professor Weinlechner[3] also records a second case of primary sarcoma of the vagina in a child aged one year. The tumour was first seen to project from the vulva a week before the patient was brought for advice. Examination revealed the presence of multiple vaginal polypi, some of which were removed, and the vaginal wall was scraped. The operation was repeated, and the child died 3rd February 1886, having been admitted into the hospital on the 29th September in the previous year. The vagina was found at the post-mortem examination to be crammed with polypi, which grew more especially from the left side and upper part of the vaginal wall.

Case 22.—Körner[4] met with a case in a child aged two years. Death occurred a few months after he first saw the patient. The growth was a fibro-sarcoma springing from the posterior wall of the vagina, but infiltrating the vesico-vaginal septum. There were numerous polypoid masses in the vagina.

[1] Wiener Klin. Woch., 1888, pp. 148, 225.
[2] Ibid., 1889, p. 109.
[3] Op. cit., p. 130.
[4] Quoted by Pick, Archiv f. Gynäkol., Bd. xlvi. 1894, p. 220.

Case 23.—Pick[1] has recently published an important paper upon "Sarcoma of the Uterus and Vagina in Children." His attention was drawn to the subject in much the same way as my own. A child aged two years was brought to him complaining of abdominal pain. A tumour projected from her vulva when she strained, as she was obliged to do, in passing water. The pain soon became worse, and the child had a stinking vaginal discharge. She was first seen in March 1892, and she died in the following September. The growth was a spindle-celled sarcoma which had infiltrated the pelvic organs. There was no evidence of secondary deposits in the other organs. The kidneys were congested, but were not otherwise diseased.

Case 24.—Ganghofner[2] had a girl aged eight years under his care for a tumour growing from the anterior wall of the vagina. It was lobulated, and of the size of a hazel-nut. Professor Chiari removed a piece for diagnostic purposes, and found that it was "a medullary cancer of the mucous glands of the cervix uteri." The growth extended between the bladder and the uterus, but the uterine mucous membrane was not ulcerated.

Case 25.—Weinlechner[3] records a case which is in some respects similar to the foregoing. He had under his care a girl aged $2\frac{3}{4}$ years for recurrent tumours, each as large as a cherry, which grew from the urethra. There were similar masses in the bladder. Dr. Weinlechner said that he had seen an identical condition in the bladder of a boy.

Kolisko, too, watched Weinlechner's cases of primary sarcoma of the vagina in children, and he has written a valuable paper upon the subject, which is published in the *Wiener Klin. Woch.*, 1889, pp. 109, 130, 159, 182, 202, 222.

It appears from a consideration of the foregoing cases that primary sarcoma of the vagina is only a specialised form of malignant disease which may affect any or all of those connective tissues which are involved in the complicated developmental processes associated with the formation of the cloaca. The sarcoma grows in the connective tissue of the pelvic organs, and extends into the bladder, the urethra, the uterus, or the vagina. It is either well circumscribed, as it was in my own case, or it is diffuse, as it was in the second case reported by Dr. Ahlfeld (No. 12, p. 130); but whether it is circumscribed or whether it

[1] Archiv f. Gynäkol., Bd. xlvi. p. 192.
[2] Quoted by Pick, op. cit., p. 209.
[3] Med. Press and Circular, 1888, i. p. 616.

is diffuse, whether it affects the vagina alone, or whether it infiltrates all the neighbouring organs, this form of sarcoma shows an almost constant tendency to become polypoid and multiple, a characteristic which is well recognised by German pathologists, who have applied the term racemose sarcoma (*Traubensarcom*) to this variety of new growth which affects the female generative organs.

Primary sarcoma as it occurs in children does not, in the majority of cases, run a very rapid course. It does not ulcerate very readily. It does not usually affect the lymphatic glands. It does not disseminate, but its prognosis is very grave. It recurs quickly after removal, and it kills by interfering with the action of the pelvic organs, by retention of urine more often than by obstruction of the bowels. The diagnosis is easy, but the polypi are often looked upon as innocent growths, and their true nature remains unrecognised until the presence of a tumour in the pelvis shows that it is too late for surgical interference. Yet this need not be, for multiple polypi of the rectum and of the genito-urinary tract in young people are so rare, and are so often associated with malignant disease, that their presence should always lead to a suspicion of such a condition. It is insufficient to remove such polypi; it is insufficient even to determine by microscopical examination that some of them are innocent, for it may be that only "a tab" of skin or mucous membrane has been examined. Our Museum contains examples of multiple and innocent polypi of the rectum in a boy which were associated with a cancerous stricture of the bowel. Malignant growths may lurk behind such polypi either in the present or in the very near future, and in examining such a patient it should be borne in mind that the growth may be diffuse from the beginning. The vesico-vaginal and the recto-vaginal septa in girls and the recto-vesical space in boys should therefore be explored as thoroughly as possible, and the surgeon should satisfy himself that neither is thickened before he ventures upon a diagnosis.

The complete cure which has been effected in one or two cases of primary sarcoma of the vagina in children shows that the early and complete removal of the growth may be as effectual in this as in other forms of malignant disease. An early and sufficient operation should therefore be advocated in these cases, and the surgeon should not content himself with scraping away the polypoid masses, for Billroth's case (No. 4. p. 127) shows how rapidly such growths may be reproduced.

The specimen upon which this paper is based was shown at the Pathological Society of London. It is preserved in the Museum, No. 3030A.

THE PROGNOSIS OF TETANUS.

BY

G. V. WORTHINGTON, M.B.

From the examination of cases reported in the journals of the last eleven years—1884–94—the prognosis of tetanus appears to depend chiefly on three factors, namely:—

1. Incubation period.
2. Rapidity of onset and severity of the spasms.
3. Duration of disease.

Of these three, the incubation period is perhaps the most important, the rapidity of the onset coming next. Although these two, as a rule, run together—viz., short incubation period and rapid onset—it is not always so; nor is it always the case that with a short incubation period and rapid onset the spasms are severe.

The gravity of the prognosis is, roughly speaking, in inverse proportion to the length of incubation period and the duration of the disease, and in direct proportion to the rapidity of the onset and the severity of the spasms.

As regards treatment, it is specially interesting to discuss its value, because the Italians have lately claimed great success for the antitoxin or serum treatment, and demand high prices for their preparations. It appears, however, that the prognosis is not materially affected by any special treatment. Dr. Kanthack[1] has recently published a list of all cases of tetanus treated with antitoxin up to March 31, 1895. He shows that the serum treatment has not actually changed the prognosis in acute and serious or severe cases. A difficulty in estimating the value of the serum treatment is the uncertainty of the tetanus mortality. He says: "Authorities differ greatly in their estimates. The hospital percentage of deaths is estimated by Behring at from 80 to 90 per cent., while according to Albertoni it is only 21 per cent., and according to Sormani 44 per cent. According to Richter, the death-rate among

[1] Medical Chronicle, May 1895.

TABLE I.

No. of Case.	Reference.	Traumatic or Idiopathic.	Incubation.	Onset.	Treatment.	Effects of Treatment.	Age.
1	*Brit. Med. Jour.*, 1892, vol. ii. p. 478.	Traumatic.	10 days.	Not stated.	Not stated.	Death in 17 days.	9
2	J. P. Glover, *Lancet*, 1884, vol. ii. p. 492.	Traumatic. Scratch with rusty nail.	10 days.	Slow.	Ice to head and spine; purge; chloral and morphine injections. Begun 4th day, continued to end.	Death on 7th day from exhaustion and sudden failure of respiration.	26
3	William Anderson, *Lancet*, 1888, vol. i. p. 212.	Traumatic. Puncture in foot.	10 days.	Rapid: spasms general in few hours.	Free incision into part. Post-tib. nerve stretched and divided. Nutrient enemata; curere hypder. injections. Begun 1st day, continued to end.	Death 14 hours from onset.	30
4	Thomas B. Adams, *Lancet*, 1888, vol. ii. p. 419.	Traumatic. Operation for piles.	10 days.	Rapid.	Chloral; fluid nourishment. Begun 2nd or 3rd day, continued to end.	Limited number of spasms. Death on 6th day from exhaustion.	
5	Pearce, *Brit. Med. Jour.*, 1887, vol. ii. p. 626.	Traumatic. Crushed finger.	10 days.	Not stated.	Chloral and bromide. Begun 1st day, continued to end.	Died on 5th day from exhaustion.	61
6	Macdougal, *Lancet*, 1884, vol. ii. p. 140.	Traumatic. Needle in hand.	10-12 days.	Spasms limited to arm.	Incision to look for point of needle; all structures divided deeply.	Spasms ceased.	
7	Taylor, *Lancet*, 1884, vol. ii. p. 272.	Traumatic. Operation.	9 days.	General on 7th day.	Opium; chloral in large doses.	Worse; last spasm on 23rd day. Cramp and weakness for another few days. Complete recovery.	42
8	Mayland, *Brit. Med. Jour.*, 1891, vol. i. p. 1384.	Traumatic. Rusty nail in foot.	10 days.	General in 2 days.	Chloral; fluid nourishment. Begun on 3rd day, continued 25 days.	Improvement on 2nd day. Complete recovery.	14

9	Fisher, *Lancet*, 1890, vol. ii. p. 559.	Traumatic. Cut head.	8 days.	Slow; general in 6 days.	Fluid nourishment; tinc. belladonna. Begun on 4th day. Fibres removed from wound; digitalis; chloroform; sulphuric ether on 9th day.	Well in 45 days.	56
10	Foulds, *Brit. Med. Jour.*, 1884, vol. i. p. 1207.	Traumatic.	14 days.	Slow; general in 8 days; not severe.	Chloral, large doses. Begun at onset till 10th day.	Well, except for some rigidity of leg, on 10th day. Recovery.	17
11	Pierce, *Brit. Med. Jour.*, 1887, vol. ii. p. 626.	Traumatic. Crushed finger.	12 days.	Slow; spasms infrequent.	Chloral; bromide. Begun 1st day, continued 27 days.	Complete recovery.	72
12	Pontlin, *Brit. Med. Jour.*, vol. i. p. 74.	Traumatic. Cut head with broken window.	15 days.	General on 4th day.	Chloral; bromide; salicine, gr. xx.; pot. brom., gr. xx.	Getting worse. Began to improve. Convalescent in 6 weeks.	26
13	Rockliffe, *Brit. Med. Jour.*, 1890, vol. ii. p. 87.	Traumatic.	9 days.	Ptosis and facial paralysis.	Wound explored and well washed with perchloride of mercury.	Recovery from spasms in 3 weeks. Diplopia and ptosis for 12 weeks.	7
14	Murphy, *Lancet*, 1885, vol. i. p. 382.	Traumatic. Crushed thumb.	16 days.	Spasms general by 4th day.	Purge; chloral and bromide. Amputation of thumb. Nutrient enemata. Begun 4th day, continued 20 days.	Spasms less within 24 hours. Complete recovery in 24 days.	15
15	Woodcock, *Lancet*, 1885, vol. ii. p. 849.	Traumatic. Crushed foot.	28 days.	Gradual.	Purge; turpentine enema; stimulants; injections of atropin; locally opium dressings. Begun 1st day, continued 13 days.	Spasms less and less till 13th day, on which were signs of atropin poisoning. Complete recovery.	13
16	Jackman, *Lancet*, 1886, vol. i. p. 1112.	Traumatic. Crushed finger.	4 or 5 weeks.	Gradual.	Chloral (10 days); urethan; fluid nourishment.	No abatement. Symptoms abating. Recovery established 15 days.	15

TABLE I.—*continued.*

No. of Case.	Reference.	Traumatic or Idiopathic.	Incubation.	Onset.	Treatment.	Effects of Treatment.	Age.
17	Cotarill, *Lancet*, 1887, vol. i. p. 21.	Traumatic. Stab in ball of thumb.	12 days.	Spasms general on 4th day.	Calabar bean; chloral and bromide; eserine, gr. $\frac{1}{15}$. Begun 1st day; excision of cicatrix and parts round on 22nd day.	Symptoms less. Great cardiac depression. One slight spasm after complete recovery.	39
18	Falconer Murison, *Lancet*, 1887, vol. i. p. 170.	Traumatic.	14 days.	Spasms general 6th or 7th day.	Chloral and bromide; cannabis indica; hypodermic injection morphine; fluid nourishment and stimulants. Begun 1st day, continued 40 days.	Symptoms progressing. No effect. Gradual recovery in 6 weeks.	26
19	Edmund Owen, *Lancet*, 1888, vol. i. p. 670.	Traumatic. Crushed right leg.	16 days.	Slow.	Kept under influence of morphia; stimulant and fluid nourishment. Begun 1st day, continued 38 days.	Recovery 12 weeks after onset.	36
20	Clapp, *Lancet*, 1888, vol. ii. p. 111.	Traumatic. Nail in little finger.	3 weeks.	Not stated.	Purge; pot. brom. and hyoscyamus; fluid nourishment. Strophanthus. Begun 1st day.	No improvement. Improvement on 3rd day. Recovery in 3 weeks.	23
21	Oldhand, *Lancet*, 1888, vol. ii. p. 314.	Traumatic. Lacerated wound of hand.	13 days.	General on 4th day.	Salicylate of soda; extract of physostigma.	No change till 13th day, when decided improvement. Complete recovery in 6 weeks.	19
22	Savill, *Lancet*, 1888, vol. ii. p. 1013.	Traumatic. Cut wrist.	2 weeks.	Moderately rapid.	Chloral; chloroform twice. Begun 4th day, continued 35 days.	Spasms less. Ceased 25th day. Well end of 7 weeks.	20
23	Makins, *Lancet*, 1889, vol. ii. p. 114.	Traumatic. Wound of sole of foot.	11 days.	Slow; general on 15th day.	Chloral; excision of wound and part of 2nd digital nerve. Begun 14th day.	Improvement next day, marked on 3rd day. Recovery 6½ weeks.	23

24	Duff, *Lancet*, 1891, vol. i. p. 307.	Traumatic. Crushed hand.	6 weeks.	Never general.	Chloral and bromide; cannabis indica.	Steady improvement. Complete recovery in 5 weeks.	
25	Huntingdon, *Lancet*, 1892, vol. ii. p. 662.	Traumatic. Cut head.	8 days.	Never general; dysphagia; double facial paralysis.	Chloral and bromide; hyoscyamus.	Symptoms gradually subsided. Well in 6 weeks.	14
26	Chomeley, *Lancet*, 1892, vol. ii. p. 718.	Traumatic.	17 days.	General in 4 days.	Chloroform; food and chloral by tube; fluid nourishment and stimulants. Begun 4th day.	Improvement on 2nd day. Relapse. Improvement on 13th day. Recovery.	7
27	Fisher, *Lancet*, 1893, vol. ii. p. 1383.	Traumatic. Crushed finger.	20 days.	General in 5 days.	Removal of nail; corrosive dressings; opium at night. Begun 7th day.	22nd day spasms less. 26th day sit up dressed. Well in 5 weeks.	30
28	Henry Morris, *Lancet*, 1894, vol. i. p. 206.	Traumatic. Injury to left knee.	15 days.	Slow; general in 6 days.	Chloral and morphia. Begun 5th day. Rectal inject. of carbolic acid on 11th day; Physostigma on 15th day.	Left hospital on 25th day. Convalescent.	22
29[1]	Winfield-Roll, *Lancet*, 1894, vol. i. p. 206.	Traumatic. Crushed thumb.	7 days.	Not stated; severe.	Bromide and chloral; injections of antitoxin. *Local*—Nail removed; carbolic poultice.	Spasms worse and more frequent. Spasms less on 2nd day of injections. Gradual improvement. Ceased on 12th day.	14
30	*St. Bartholomew's Hospital Reports*, 1887, p. 243.	Traumatic. Injury to tongue.	2 days.	General in 8 days; not severe.	Chloral and bromide; purge. Begun 16th day, continued 35 days.	Gradual recovery. Cured 8 weeks.	12
31	Thomson, *Lancet*, 1894, vol. i. p. 843.	Traumatic. Cut thumb.	6 days.	Slow; not severe; general 14th day.	Opium; chloral and bromide. Begun 14th day.	Convalescent end of 6th week.	13
32	Paris Correspondent, *Lancet*, 1893, vol. ii. p. 1159.	Traumatic. Accidental inoculation.	4 days.	General on 10th day.	Chloral. Begun on 10th day.	Stationary 4 days. Improvement 16th day. Recovery 11 weeks.	

[1] This case should have been omitted by the writer (A. A. Kanthack).

TABLE I.—*continued.*

No. of Case.	Reference.	Traumatic or Idiopathic.	Incubation.	Onset.	Treatment.	Effects of Treatment.	Age.
33	Hunt, *Lancet*, 1892, vol. ii. p. 497.	Traumatic. Compound fracture.	5 days.	General 3rd day.	Zinc sulphate; opium; *local* irrigation.	Recovery.	
34	Thomson, *Brit. Med. Jour.*, 1884, vol. ii. p. 1206.	Traumatic. Lacerated scrotum.	30 hours.	Sudden.	Pilocarpine within 1 hour; iodide and bromide of potassium 2nd day.	Profuse perspiration and salivation after. Convulsions ceased. Cured 10 weeks.	22
35	Edgar Flynn, *Lancet*, 1884, vol. ii. p. 236.	Traumatic. Crushed finger.	5th day.	Not stated.	Cannabis indica; chloral hydrate; pot. brom.; injections of morphia.	Recovery in 6 weeks. Much emaciated.	
36	Hare, *Brit. Med. Jour.*, 1884, vol. ii. p. 652.	Traumatic. Operation.	4 days.	Rapid; general in 36 hours.	Bromide and chloral. Begun at once.	Death 48 hours from onset.	
37	St. George, *Brit. Med. Jour.*, 1891, vol. ii. p. 191.	Traumatic.	3 or 4 days.	General in 3 days.	Chloral; purge; hot pack every 2nd day. Continued 25 days.	Improvement 2nd day. Cured 47 days.	8
38	Benington, *Brit. Med. Jour.*, 1885, vol. i. p. 1101.	Traumatic after labour.	7 days.	Very rapid; general in few hours.	Not stated.	Death in 24 hours from onset.	
39	Verzrusky, *Brit. Med. Jour.*, 1890, vol. i. p. 312.	Traumatic. Ruptured perineum.	3 days.	General in 2 days.	Not stated.	Death on 12th day.	23
40	Sturges, *Lancet*, 1888, vol. i. p. 417.	Traumatic. Puncture in sole of foot.	5 or 6 days.	General in 12 hours.	Purge; chloral; pot. brom. Begun 1st day.	Death 32 hours after onset.	64
41	Adam, *Lancet*, 1888, vol. ii. p. 439.	Traumatic. Crushed toe.	5 days.	Rapid.	Pot. brom.; chloral. Begun 1st day.	Death 2nd day after onset from exhaustion.	32
42	Roberts, *Lancet*, 1891, vol. ii. p. 61.	Traumatic. Wound of face.	4 days.	Never general; paralysis of 3rd, 4th, and 7th nerves right side.	Chloral; tinct. opii. Begun 3rd day, continued to end.	Died 5th day from exhaustion.	64

43	Hasting-Gifford, *Lancet*, 1893, vol. i. p. 277.	Traumatic. Uronatorum.	4 days.	Rapidly general.	Castor-oil.	Fatal.	4 days.
44	Bowlby, *St. Bartholomew's Hospital Reports*, 1883, p. 85.	Traumatic. Nail in sole of foot.	3½ days.	Very rapid and severe.	Wound exposed; pus let out; edges of skin cut away; enema of chloral and bromide. Begun few hours after onset.	Death 27 hours after onset of asphyxia.	37
45	Bowlby, *St. Bartholomew's Hospital Reports*, 1883, p. 85.	Traumatic. Exfoliation of ear.	3 days.	Very rapid and severe.	Chloroform; chloral and bromide; fluid nourishment and stimulants. Begun in few hours.	Death in 16 hours.	30
46	Bowlby, *St. Bartholomew's Hospital Reports*, 1885, p. 87.	Traumatic. Disease of ankle-joint.	4 weeks (? 7 days).	Rapid and severe.	Amputation. Opium; Calabar bean; chloroform. Begun day after onset.	Death in 2 days.	27
47	Bowlby, *St. Bartholomew's Hospital Reports*, 1883, p. 87.	Traumatic. Cut finger.	14 days.	General in 4 days.	Injection of morphia. Begun 4 days after onset, continued to end.	Death 7 days after onset.	49
48	Bowlby, *St. Bartholomew's Hospital Reports*, 1882.	Traumatic. Lacerated scalp wound.	6 days.	Slow.	Purge; chloral and bromide.	Death from exhaustion 20 days after onset.	34
49	Standage, *St. Bartholomew's Hospital Reports*, 1891, p. 211.	Traumatic. Wounds.	4 days.	Rapid.	Chloroform; purge. Begun day after onset, continued to end.	Death about 29 hours from respiratory failure.	27
50	Standage, *St. Bartholomew's Hospital Reports*, 1891, p. 213.	Traumatic. Puncture of right hand.	5 days.	General in 24 hours.	Chloral and morphine. Begun day after onset, continued to end.	Death in 34 hours from asphyxia.	35
51	Pietes Rosi, *Lancet*, 1884, vol. ii. p. 508.	Traumatic. Hypodermic injection.	4 days.	General in few hours.	Chloral clysters.	Death 30 hours after onset.	18
52	Macdougal, *Lancet*, 1884, vol. ii. p. 140.	Traumatic. Operation.	7 days.	Acute.	Large doses of chloral and pot. brom. Division of ext. popliteal nerve.	No effect. Improvement for 36 hours. Death from asphyxia.	

TABLE I.—*continued.*

No. of Case.	Reference.	Traumatic or Idiopathic.	Incubation.	Onset.	Treatment.	Effects of Treatment.	Age.
53	Wilding, *Brit. Med. Jour.*, 1893, vol. i. p. 405.	Idiopathic.	...	General in 2 days.	Pot. brom.; morphine; enema. Begun 2nd day, continued 2 days.	Sudden death on 4th day.	49
54	Cureton, *Lancet*, 1884, vol. i. p. 422.	Idiopathic.	...	Slow.	Pot. brom.; vapour bath.	Death on 6th day.	78
55	Churchouse, *Brit. Med. Jour.*, vol. i. p. 719.	Idiopathic.	...	General on 4th day.	Not stated.	Death from exhaustion in 7 days.	16
56	Alexandre, Paris, *Brit. Med. Jour.*, 1890, vol. i. p. 505.	Idiopathic.	...	Not stated.	Purge; chloral; antipyrin.	Sudden and complete recovery on 21st day.	65
57	Headley-Neal, *Brit. Med. Jour.*, 1889, vol. i. p. 586.	Idiopathic. Cold and damp.	5 days.	Not stated.	Chloral; predigested liquid food. Begun 1st day, continued 33 days.	Recovery 33 days after onset.	12
58	Sheen, *Brit. Med. Jour.*, 1889, vol. i. p. 710.	Idiopathic.	...	Slow; mild.	Morphine; warm bath daily; fluid nourishment. Begun 4th day, continued 8 days.	Complete recovery in about two months from onset.	14
59	Royle, *Lancet*, 1885, vol. i. p. 1080.	Idiopathic. Fright?	2 days?	Slow.	Purge; chloral, opium, and Indian hemp. Begun 10th day, continued 21 days.	Recovery in 3 weeks.	
60	Hawkes, *Lancet*, 1887, vol. i. p. 264.	Idiopathic. Wet and cold.	...	Spasms general 7th day.	Purge; chloral and bromide; belladonna and poultices to spine. Begun 7th day, continued 43 days.	Gradual improvement. Recovery in 6 weeks from commencement of treatment.	13
61	Mellone, *Lancet*, 1891, vol. ii. p. 486.	Idiopathic.	1 day?	General in 2 days.	Bromide and chloral; Calabar bean; opium; nutrient enemata and brandy mixture. Begun 2nd day.	Recovery.	

62	Macdougal, *Lancet*, 1884, vol. ii. p. 140.	Traumatic. Wound of wrist.	Not stated.	Not stated.	Excision of injured piece of nerve.	Spasms ceased within 24 hours.	30
63	Welpton, *Lancet*, 1887, vol. i. p. 367.	Traumatic.	Not stated.	Not stated.	Chloroform; pot. brom. (big doses).	Recovery in 2 or 3 days.	32
64	Ballard, *Brit. Med. Jour.*, 1885, vol. i. p. 836.	Weak ulcer in leg; abscess in mouth.	Not stated.	Not stated.	Bromide and chloral; purge. Begun at once, continued 3 days.	Soreness of mouth. Recovery in 24 days.	27
65	Snell, *Brit. Med. Jour.*, 1889, vol. i. p. 479.	Traumatic.	Not stated.	Very rapid.	Not stated.	Death 23 hours after onset from spasm of respiratory muscles.	25
66	Dobli, *Lancet*, 1888, vol. i. p. 719.	Traumatic. Injury to sole of foot.	Not stated.	Rapid.	Purge; chloroform; hot bath; chloral. Begun at once.	Death within 30 hours from onset from exhaustion.	30
67	St. George, *Brit. Med. Jour.*, 1891, vol. ii. p. 191.	Traumatic.	Not stated; less than 4 days.	Not stated; less than 4 days.	Chloral.	No relief. Death 2nd day from exhaustion and asphyxia.	24
68	Blume, *Brit. Med. Jour.*, 1892, vol. ii. p. 75.	Traumatic. Suppurating wound.	Not stated.	General in 2 days.	Chloral and morphine. Begun 2nd day, continued till end.	Death on 6th day.	

acute cases is 96 per cent.; among chronic cases, 55 per cent., figures which agree more or less with those given by Poland." Fresh statistics are required; and therefore, on Dr. Kanthack's suggestion and with his assistance, I undertook to collect a number of cases from the *Lancet*, *British Medical Journal*, and St. Bartholomew's Hospital Reports from 1884 to 1894, which had not been treated with antitoxin, to compare them with those treated with antitoxin, collected by him and reported in his paper.

Now, in collecting cases from journals, it must always be remembered that there must be the absence of completeness, for the reason that all cases are not published; cures are published oftener than deaths, successes, real or imaginary, oftener than failures. Nevertheless, there is some use in the figures thus obtained, when it is our object to criticise a new therapeutic method, or to control other statistics; for they make us cautious in our judgment, and remind us that a few consecutive successes do not establish the soundness of any reasoning or new form of treatment.

(1.) Age apparently affects the prognosis but a little, except in so far as very young infants and very old people have a much smaller power of resistance than persons at other periods of life. Tetanus neonatorum is said to be very fatal.[1]

(2.) It has been said that cases complicated by a suppurating wound, or one which subsequently suppurates, are more serious than those due to the infection by punctured or clean-cut wounds. This does not appear to be so from the examination of recorded cases, perhaps because in reporting the cases care has not been taken to note this point.

(3.) In arranging the cases collected, attention has been specially paid to the incubation period, and we shall consider, roughly speaking, those cases as acute which have an incubation period varying from one to seven days, as chronic those which have an incubation period of eight days or more. This distinction of acute and chronic cases, as Dr. Kanthack has pointed out, is important, since the prognosis is much more favourable in chronic cases of tetanus.

(4.) Notice has also been taken of the rapidity of the onset and the duration of the disease. In Table I. (pp. 138–145) all the cases, acute, chronic, and other, have been enumerated.

From this table we learn that of 68 cases of tetanus 28 died, *i.e.*, we have a mortality of 41.17 per cent., a figure which closely agrees with Sormani's estimate, which was based upon

[1] Fronz (Jahrbücher f. Kinderheilk., xl., 1895) shows, however, that it amounts to only 41.66 per cent.

Italian hospital statistics. In this table, however, the cases have not been separated according to their severity or acuteness, and we must now inquire whether the mortality is greater amongst acute cases than amongst chronic cases so far as they have been published.

In addition to these cases, I have found 23 cases in Baumgarten's Reports for 1891, 1892, and 1893; cases treated with various drugs. Of these, five died, *i.e.*, a mortality of 21.6 per cent. Adding these to Table I., we would get 91 cases with 33 deaths, *i.e.*, a death-rate of 36.26 per cent.

In Table II. the cases with acute onset or incubation period lasting a week or less are collected and arranged according to their incubation period for comparison with Table III., which contains the cases with a more prolonged incubation period.

TABLE II.—*Acute Cases.*

No. of Case.	Incubation Period.	Result.	Remarks.
34	20 hours	Cured	
30	2 days	Cured	Really a chronic case, spasms taking 8 days to become general, and were not severe.
39	3 ,,	Death 12th day	
45	3 ,,	,, 16 hours	Very rapid onset.
44	3½ ,,	,, 27 ,,	,, ,,
36	4 ,,	,, 48 ,,	,, ,,
32	4 ,,	Cured in 11 weeks	Really a chronic case, not general till 10th day.
37	3–4 ,,	Cured in 6½ weeks	
42	4 ,,	Death 5th day	A case of the so-called cephalic tetanus, spasms never general.
43	4 ,,	Death	
49	4 ,,	Death 29 hours	Very rapid.
51	4 ,,	,, 30 ,,	,, ,,
33	5 ,,	Cured	
35	5 ,,	Cured in 6 weeks	
41	5 ,,	Death 3rd day	Rapid onset.
50	5 ,,	,, 34 hours	,, ,,
40	5 or 6 ,,	,, 32 ,,	Very rapid onset, 12 hours general.
31	6 ,,	Cured in 6 weeks	Really chronic case, onset slow, spasms not severe.
48	6 ,,	Death in 20 days	
29	7 ,,	Cured	
38	7 ,,	Death in 24 hours	Very rapid onset.
52	7 ,,	Death	Onset rapid.
46	7 ,,	Death in 2 days	,, ,,
49	?4 weeks ?14 ,,	,, 7 ,,	Really an acute case.

Cases 46 and 49 have been included in this list, because they are evidently acute, although there is some uncertainty as to

the duration of the incubation period. From this table we learn that of 24 acute cases 16 died, *i.e.*, 66.6 per cent. But now let us examine more closely the cases which recovered. We find that in Case 30 the onset was gradual, although the incubation period was short; the treatment was not begun until sixteen days after the onset. Similarly Case 32 is essentially chronic, so also is Case 31. These cases we must subtract from the others, so that of 21 cases 16 died, a mortality of 76.19 per cent. Possibly this figure would read higher if the histories were given more fully and all cases reported, but we are obliged to accept them as we find them.

In Table III. the chronic cases have been enumerated.

TABLE III.—*Chronic Cases.*

Case.	Incubation Period.	Result.	Remarks.
24	6 weeks	Cured in 5 weeks	
16	4 or 5 ,,	,, 15 days	
15	4 ,,	Cured	
20	3 ,,	Cured in 3 weeks	
27	3 ,,	,, 5 ,,	
26	17 days	Cured	
14	16 ,,	Cured in 24 days	
19	16 ,,	,, 12 weeks	
12	15 ,,	,, 6 ,,	
28	15 ,,	,, 25 days	
10	14 ,,	Cured	
18	14 ,,	Cured in 6 weeks	
22	14 ,,	,, 7 ,,	
21	13 ,,	,, 6 ,,	
11	12 ,,	Cured	
17	12 ,,	,,	
6	10–12 ,,	,,	
23	11 ,,	Cured in 6½ weeks	
1	10 ,,	Death 17th day	Rapidity of onset not stated.
2	10 ,,	,, 7th ,,	
3	10 ,,	,, in 14 hours	Very rapid onset.
4	10 ,,	,, 6th day	Onset rapid.
5	10 ,,	,, 5th ,,	
8	10 ,,	Cured	
13	9 ,,	Cured in 12 weeks	
7	9 ,,	Cured	
9	8 ,,	Cured in 45 days	
25	8 ,,	,, 6 weeks	

Here we have 28 milder or more chronic cases with five deaths, or a mortality of only 17.8 per cent.

Now if we examine the fatal cases, we find a rapid onset in Nos. 4 and 3, so that these are really acute cases. Hence the cases should read 26 milder cases with three deaths, or with a mortality of 11.5 per cent. And adding to these 26 cases the

three more chronic cases from Table II., we have a mortality of 10.3 per cent.; while on transferring Cases 4 and 3 to Table II., the death-rate in acute cases would become 78.2 per cent.

In the next table the so-called "Idiopathic" cases have been placed. They are nine in number with three deaths, or a mortality of 33 per cent. With two exceptions, Nos. 53 and 55, they appear to be chronic. Unfortunately this number is too small to warrant any conclusion being drawn from them. "Idiopathic" cases are generally chronic in nature, and I would suggest probably have a long incubation period, allowing a slight wound or scratch to have healed and been forgotten, and therefore the prognosis in "Idiopathic" cases is better than in cases of "Traumatic Tetanus." One need hardly remark that they are due to a true infection by the tetanus bacillus and an intoxication with its toxin, so that the term "Idiopathic" must be discarded.

TABLE IV.—"*Idiopathic Cases.*"

No. of Case.	Onset.	Result of Treatment.	Remarks.
53	General in 2 days	Death on 4th day	Acute.
55	General on 4th day	Death on 7th day	Acute.
54	Slow	Death on 6th day	
56	Not stated	Cured	
57	Not stated	,,	
58	Slow and mild	,,	
59	Slow	,,	
60	General 7th day	,,	
61	General in 2 days	,,	

(5.) In looking through the cures among the cases with a short incubation period, we find three cases, Table V., viz., 30, 32, 31, whose incubation period was two, four, and six days respectively, but in which the onset was slow, the spasms becoming general in eight, ten, and six days respectively.

TABLE V.

No. of Case.	Incubation.	Onset.	Cured.
30	2 days	General, 8 days	Cured.
32	4 days	,, 10 days	,,
31	6 days	,, 6 days	,,

But in looking through the deaths in cases with longer incubation periods, we find five cases (Table VI.) in which the onset was rapid, viz., Nos. 38, 46, 3, 4, 47.

In three of these, viz., 38, 46, 3, death supervened very quickly, and it will be noticed that the onset was especially rapid in these three cases.

In Case No. 3 death occurred fourteen hours after the onset, which was described as "very rapid."

In Case No. 38 death occurred twenty-four hours after the onset, which was rapid, the spasms becoming general in a few hours.

In Case No. 46 death occurred in two days from the onset, which was described as "rapid."

It will be noticed that the case in which death came on quickest, viz., No. 3, had an incubation period of ten days. This, if the incubation period were the only factor which determined the prognosis, would be a chronic case. So also with Case 46, in which the incubation period is doubtful, but may have been as long as four weeks.

Added to these we have three fatal cases, viz., 65, 66, and 68, in which the incubation period is not stated, but whose onset was rapid.

The spasms in Case 68 became general in two days.

The onset in Case 65 was described as very rapid.

And in Case 66 was described as rapid.

Table VI.

No. of Case.	Incubation.	Onset.	Result.
38	7 days	General in few hours	Death in 24 hours.
46	7 days to 4 weeks	Rapid	Death in 2 days.
3	10 days	Very rapid	Death in 14 hours.
4	10 days	Rapid	Death in 6 days.
47	14 days	Rapid	Death 7th day.
65	Not stated	Very rapid	Death in 23 hours.
66	,, ,,	Rapid	Death in 30 hours.
68	,, ,,	2 days	Death on 6th day.

Amongst the idiopathic cases there are three deaths, in two of which the onset was fairly rapid, viz., general, in two and three days.

From these tables it appears that the prognosis depends greatly on the rapidity of the onset, quite apart from the incu-

bation period, its gravity being, roughly speaking, in direct proportion to it, and it is *the* important point to take notice of in making a prognosis.

(6.) *The Duration of the Disease.*—In Table VII. all deaths are enumerated, 28 in number, and arranged according to the day on which death occurred.

TABLE VII.

Date.	No.	Date.	No.
Deaths under 2 days . .	10	Deaths on 6th day . .	3
,, on 2nd day . .	3	,, ,, 7th day . .	3
,, ,, 3rd day . .	1	,, ,, 12th day . .	1
,, ,, 4th day . .	1	,, ,, 17th day . .	1
,, ,, 5th day . .	2	,, ,, 20th day . .	1

Two cases described as rapid, but whose duration is not stated.

On examining this table, we find that 13 out of 26, viz., 50 per cent. of all deaths whose date was published, occurred within two days; that 23 out of 26, or 88.5 per cent. of all deaths, occurred within seven days, and if we include the two cases described as rapid but whose duration is not stated, this last percentage would be brought up to 89.3 per cent.

Hence, according to this table the gravity of the prognosis is, roughly speaking, inversely proportionate to the duration of the disease, improving as each day is added to it. If the patient lives a week, as a rule the prognosis is good, as only 10.7 per cent. die after that date.

(6.) *In considering the Effect of Treatment* on the prognosis, the figures obtained from cases treated in any way except by the antitoxin, may be compared with those obtained by Dr. Kanthack in cases so treated.

The figures obtained from Table II., viz., 66.6–76.19 per cent., agree fairly well with those given by Dr. Kanthack, for we find in his Table III. that among the acute cases treated with antitoxin the death-rate might be taken as either 69.2 or 85.7 per cent., according to whether we include all cases as they have been reported, or whether we exclude cases which were evidently chronic or which had been treated too late.

The figures obtained in Table III., viz., 17.8 per cent., is very near to that given by Dr. Kanthack in his Table III. B. viz., 15.78 per cent.

Comparing these figures with those obtained by Dr. Kanthack, we find the following results:—

(*a.*) Death-rate of all cases.
  (i.) Antitoxin cases, 37 per cent.
  (ii.) Ordinary cases, 36.26 per cent.
(*b.*) Death-rate of acute cases.
  (i.) Antitoxin cases, 85.7–69.2 per cent.
  (ii.) Ordinary cases, 78.2–66.6 per cent.
(*c.*) Death-rate of chronic cases.
  (i.) Antitoxin cases, 15.78–5.7 per cent.
  (ii.) Ordinary cases, 17.8–10.3 per cent.

Hence, judging from a collection of cases reported in the journals, the antitoxin has not achieved very much. This is of course not quite a fair way of judging, and cannot be until all cases are reported; but probably the figures are somewhat near being correct, since the tendency to report successes and pass over failures is probably the same whatever method of treatment is used, and the figures so obtained are interesting, and to a certain extent useful also.

It seemed important to collect what cases I could find, in order to show to what fallacies we expose ourselves if we accept the accounts of any new treatment without carefully looking into the matter.

These figures obtained by me show clearly that the milder cases benefit apparently by any kind of treatment, for the large number of cures or recoveries are always chronic or mild cases, whether we use antitoxin or any other treatment.

The value of the antitoxin can be estimated, therefore, only through its efficiency in acute cases. Dr. Kanthack has pointed this out very clearly, and my figures give further support to his conclusion that so far the serum treatment has not decreased the mortality in acute cases, *i.e.*, it has not materially bettered the prognosis, if at all. The sanguine views of the Italians were based on good results obtained with chronic cases; equally good results in such cases may be got with almost any kind of symptomatic treatment. But undoubtedly the serum treatment is the best and most rational symptomatic treatment there is.

"In milder cases," as Dr. Kanthack says, "it lessens the spasms, the pain and distress," but no really acute or otherwise hopeless case of tetanus has yet been cured with it.

The effect of treatment has been gone into at some length for the reason stated, and it has been found that no special treatment has bettered the prognosis in acute cases. In com-

paring the figures obtained by Dr. Kanthack from cases treated with antitoxin with those obtained by myself from cases treated by methods other than the antitoxin method, the death-rate in all cases is .74 per cent. higher in those treated by the antitoxin.

The death-rate of acute cases is also higher in those treated with antitoxin, viz., 1.5–2.6 per cent. higher.

But the death-rate in chronic cases is distinctly lower in those treated with antitoxin, viz., 2.02 or 4.6 per cent. lower, according to whether we take cases as reported or arrange the acute and chronic for ourselves. Hence the chronic cases seem to be those in which the antitoxin does best and has lowered the death-rate somewhat, *i.e.*, bettered the prognosis.

Sir George Humphry appears to have been right when, a year or two back, he said that no special treatment did any good; that it was important to administer stimulants and nourishing food together with absolute quiet and rest.

To conclude, figures such as these must be incomplete, for, as stated above, not nearly all cases are reported, and it is the fatal cases, or what are considered by some to be their failures, that are left out; hence the mortality is really higher than it would seem to be from the figures obtained. It may be that a greater proportion of fatal cases treated by the antitoxin than of those treated by other methods has been reported (although we know that some fatal cases have been suppressed by the Italians), and this would account for the slightly greater mortality amongst all cases, and especially amongst the acute cases treated by the antitoxin.

It must be remembered that a prognosis based on any one of the factors mentioned would not be safe. All should be considered, and it ought then to be possible to make a pretty safe prognosis.

For example, if we had a case with an incubation period of two days and a rapid onset—the symptoms becoming general in twenty-four hours—that case would almost surely be a fatal one, and would probably die within two days. But if we had a case with an incubation period of two days and slow onset, the spasms not becoming general till eight days, then the severity and frequency of the spasms would have to be taken into account. If the spasms were neither severe nor frequent, the case would very likely, as in Case 30, recover, but if the spasms were severe or became frequent, or both, the case would probably be fatal.

Again, if we had a case with an incubation period of ten days and slow onset, say five days, if the spasms were not severe the

case would most probably recover, especially if it had lasted over a week.

If the spasms were severe and frequent, the prognosis would not be nearly so good, for even cases with a long incubation period and slow onset die of asphyxia or exhaustion after several days, if spasms are severe and frequent.

ON THE MECHANICAL FACTOR IN CHLOROFORM-ANÆSTHESIA.

BY

RICHARD GILL.

The action of chloroform, like that of any other agent, depends upon its surrounding conditions. When these conditions are normal, the effects of chloroform are said to be normal, and the normal type finds expression in a contracted pupil. When they are abnormal, an entirely new set of phenomena are met with, in which the dilated pupil takes the prominent place. If the abnormal conditions exist in the patient's constitution, the result is a deviation from the type, as, for example, in fever and emaciation, where the sensitive pupil appears—a pupil which is fully dilated, but extremely sensitive to light, and contracting readily with air. But if any abnormal condition occur during the progress of normal anæsthesia, it becomes a complication of the normal, as when severe bleeding happens, or when the stomach is perturbed.

These examples serve to illustrate the abnormal conditions, which are easily recognised, because they are readily observed. There are, however, other factors which, through not being observed, tend to puzzle the chloroformist by their action. Where he anticipates a normal result, he encounters phenomena, quickly or gradually induced, pointing to danger. He has pursued the graduated method of administration; the contracted pupil has been achieved, and he forthwith reduces the amount of chloroform in use. But still, with a diminishing amount of the agent in operation — following the law of diminishing resistance—there comes suddenly an arrest of respiration, or gradually laboured respiration, dusky complexion, and a partially dilated pupil, tending to further dilatation. What is the cause of this grave change?—for it truly becomes so unless prompt measures are taken to counteract its pernicious result.

That there is some cause, independent of chloroform, but operating simultaneously and concurrently with it, cannot be denied, unless some peculiar virtue be ascribed to the latter, after the fashion of the earliest writers—amongst whom particular reference is made to Snow—who asserted, as the result of their experience, that chloroform has at times a capricious action. Now, as they do not anywhere make allusion to the possibility even of the presence of another cause acting in conjunction with the agent to which they attributed all the phenomena—and, be it remembered, it was the whole of each phenomenon—witnessed by them; as they do not adduce the paramount influence of stomachic perturbations in causing some irregularities in the progress of the anæsthetic state; and as they made no attempt to maintain a constant and uniform action of the force with which they experimented, it is not surprising to learn that at times they obtained inconstant and non-uniform results. This conclusion of theirs—the capricious conduct of chloroform—I hold to be based upon unscientific treatment of the phenomena which occurred during their investigation. Their reasoning is too strongly tainted with prejudice. Every event during chloroform-anæsthesia is, without any question as to other possible causes, related to chloroform as its sole cause. To refute this universal position is the object of the present paper. Not all those effects heretofore ascribed to capricious action are due to the caprice of chloroform.

Chloroform, if carefully prepared and separated from all impurities, is, like all other drugs which possess a medicinal and poisonous action, characterised by degrees of action according to the greater or less concentration in which it is administered. For purposes of accurate investigation, it is necessary to possess a set of constant effects, produced under normal conditions by a given amount of chloroform. I do not say a constant amount, because the quantity of chloroform required to produce the constant effects varies with age, or better, with the volume of blood in circulation. Thus, what is a poisonous dose to an infant would have but a very slight effect on a vigorous adult; and again, in cases of severe hæmorrhage, the amount necessary to maintain anæsthesia is proportionately less. These constant effects, which are—(1.) Contracted or pin-point pupil; (2.) suspension of will-power, carrying with it—(α) Rhythmical respiration; (β) regular pulse, beating at 74, and (γ) muscular relaxation—make up the normal anæsthetic state. Without the recognition of this normal anæsthetic state, it is impossible to compare with the "normal" irregular results, and therefore to elucidate their causation.

In 96 per cent. of 2000 consecutive cases this normal state of anæsthesia was obtained when chloroform was administered by the graduated method. What was attempted was to administer the agent, in so far as it could be done, by a constant method, in order to ascertain whether a constant result could be obtained. Let us take it as the fact that a constant or general result is obtained under the above-mentioned conditions. How to explain the residue of 4 per cent. Clearly there must be some variation from the normal in the constitution of these patients. For if chloroform be constant in its action, as I hold it is when all the conditions affecting it are normal, and if there be no fault in the method of administration, the only variant is the bodily state of the patient. And it is matter of fact that fever, prolonged suppuration, emaciation, and the suffering from intense and constant pain bring about such changes in tissue-nutrition and tissue-vigour as to render it, for the time being, abnormal. Now it is precisely in these abnormal bodily states that the effects of chloroform are observed to vary from the "constant." It cannot be expected that tissues which are less healthy shall have the same resisting power as normal ones; and consequently the action of the same amount of chloroform which has but an evanescent effect on the one may have a deadly influence on the other. I would, therefore, do away with this capricious action of chloroform on account of its misleading tendency. We learn nothing from it to help us. On the other hand, by concentrating all our faculties on the resisting power of our patients, we learn this all-important factor—the regulation of the amount of chloroform according to varying power of resistance.

Undoubtedly the matter is a most intricate one, and the greatest care is needed to thread our way through the maze of obscure and ofttimes conflicting evidence before us. Thus a fatal result takes place within a few minutes from the commencement of administration It may be caused by (1) asphyxia, the result of a too highly concentrated vapour of chloroform; (2) syncope, the effect of fear; (3) sudden arrest of the heart's action from structural disease; (4) from mechanical obstruction. In only one of these does chloroform play the chief part—in that of asphyxia. In the rest it is subsidiary to other causes; but though subsidiary, it is not without some, and, under certain conditions, a pernicious influence. These are found in (4), where, assuming the amount of chloroform to be in excess, but not immediately fatal excess, its local action on the tissues and blood, uncounteracted by a proper supply of oxygen, kills in the interval between suspension of respiration and its restoration by artificial means.

Or the gravity of the situation appears in the course of anæsthesia, and after the pupil has been contracted. The patient becomes faint, of vaso-motor, not cardiac origin, the pupil dilated, and the breathing shallow. Is all this the effect of chloroform, or any part of it? Not necessarily. Such signs may happen, even though the graduated method be strictly followed, and the quantity of chloroform diminished in accordance with the law of diminishing resistance. They are caused by the stomach, and disappear with vomiting. But there is danger here from the presence of chloroform. Respiration, already shallow, is suspended immediately before the emptying of the stomach. If chloroform be present in a relative overdose, that is, the new conditions of shallow breathing and impending arrest being overlooked and the same amount given, the inhibitory action of the stomach on the respiratory centre is continued beyond its normal period, and unless the upper air passages are immediately opened up (for the jaws are spasmodically contracted, and the spasm extends to the muscles round the glottis) and artificial breathing resorted to, death will ensue, from chloroform, it is true, but not uncomplicated and unavoidable. This example illustrates the importance of the early detection of signs of danger. And it also supplies us with the means of anticipating subsequent phenomena. For as soon as stomachic perturbation is determined by pallor, shallow breathing, and dilatation of the pupil, which, however, remains sensitive to light, the act of vomiting in nearly all such instances will take place at no distant time. What we have to do is to prevent this act from being impeded; and we effect this by reducing the quantity of chloroform, if necessary staying it altogether, until the stomach be emptied. Thus the twofold danger of poisoning the blood and overloading the lungs is avoided.

These symptoms and the vomiting may all be over in a minute. If the eye of the chloroformist be not always on the patient's face watching for changes, then it is said that they occur suddenly. And if the system of adding large quantities—a drachm or more—be followed, see the danger involved. A drachm is poured into the cone, and immediately afterwards stomachic disorder is manifested. It is assumed the signs are not observed at their inception; when they are recognised at last, the approach towards a fatal termination has been rapid. But the administrator is not conscious of any fault in his method. His patient had withstood the same amounts previously without evincing any ill result. Now death takes place; and the cause?—assumed irregularity in the action of chloroform!

Chloroform, if not properly administered, may kill slowly and directly by a poisonous action on the blood. It is brought about either by a gradual increase in the amount given, or by shortening the intervals between successive doses, or combining both these errors of practical detail. The blood becomes surcharged with the products of chloroform; it loses its brilliancy and deepens in colour. Congestion results from interference with nutrition; hence the bounding pulse. The congested lungs admit a diminishing amount of oxygen, and the want of oxygen in conjunction with the presence of an excessive quantity of chloroform-products, leads to malnutrition of the tissues. The blood is gradually more and more disorganised (for chloroform in too large proportion destroys the red-blood corpuscles) until death ensues from blood-poisoning. But there may be another mode of termination. The obstruction at the lungs causes distension of the right side of the heart. This distension is a burden, and throws more work upon the heart as a whole. But its labour is vastly increased by the failing energies of nutritive attraction in carrying on the capillary circulation. Besides, superadded to additional labours, the heart suffers from imperfect nutrition. Under these circumstances it becomes a question of initial cardiac vigour. If the heart be unable to withstand these difficulties from all quarters, it stops. Death takes place at the heart, and breathing, though embarrassed, may continue for some seconds. Here the heart suddenly stops; but is it rational to conclude that chloroform has exercised some peculiar action on that organ in face of the facts that (1) the blood is poisoned, and (2) the right side is distended?

From these considerations I think I am justified in concluding that very many of the instances of the so-called capricious action of chloroform are dependent on other causes, amongst which the mechanical factor takes a chief place, and, secondly, that any variations occurring during its administration depend either on the hand that administers or some abnormality of the body absorbing it. If there be a transgression on the part of the former, it falls to the account of an overdose. If the error be on the side of the patient, it is the duty of the anæsthetist to take all those measures of precaution which each deviation from the normal requires, in order to prevent the poisonous action of the agent he is using; for it must always be borne in mind that what is on some occasions an anæsthetic dose, becomes on the appearance of new conditions a poisonous one. But however great the care exercised, it is impossible to foresee the occurrence of simple syncope; by that I mean the fainting fits which some apparently healthy people are prone

to experience, and to which no other cause but some functional error of the heart can be assigned. I believe I have seen two such instances during chloroform-anæsthesia, one being in an overgrown youth who was subject to these attacks. Or the heart itself may be malformed; in such cases there comes into the reckoning some cause overlooked, or, if known, whose action was without the bounds of being counteracted.

Chloroform, therefore, exercises a mechanical action. If administered in too great a degree of concentration, it causes direct respiratory obstruction; if it circulate in a proportion more than suffices to maintain normal anæsthesia, it causes secondary distension of the right side of the heart. Were this the only effect of chloroform, no fatality ought to happen; but it has in addition a direct action on the blood. In doses beyond the anæsthetic it impairs the function of, and finally destroys, the coloured-blood corpuscles. And it is from this action that danger is to be apprehended, when it is allowed to be pent up in the blood—that is, when respiration ceases to be efficient or is arrested. Indeed, too much stress cannot be laid on the primary importance of free breathing; the agent being regulated in amount directly with respiratory alterations. If respiration fail, it should be the first concern of the chloroformist to see that the air passages are patent, and then, if necessary, to commence artificial respiration.

But the mechanical factor may operate independently of, though concurrently with, the action of chloroform. The following cases serve to illustrate the cause, effects, and remedying of this complication.

I. A middle-aged man, æt. 45, the subject of an epitheliomatous growth occupying nearly the whole of the middle and encroaching upon the posterior third of the tongue. Otherwise apparently healthy. Of the sanguineous type. He was placed under the influence of chloroform. Some struggling marked the progress of induction; but this ceased after the introduction of a gag. The pupil was contracted when anæsthesia was attained, and the breathing regular and efficient. But within a few seconds the breathing became laboured and then stopped. All the signs of impending asphyxia at once manifested themselves; the pupils, however, remaining small. The tongue was immediately pressed forward (or upward, the position being horizontal), and maintained so. With this change in the position of the tongue, respiration was re-established. Two threads were passed through the tip of the tongue to prevent it from falling back; the patient's condition returned to the

normal, and the operation of removal was completed without any further complication.

What was the cause of the respiratory interruption? Simply a mechanical one; the tongue, on falling back, carries with it the epiglottis. The epiglottis closes the upper aperture of the larynx, and thus opposes a barrier to the passage of air. But while shutting out the atmosphere, it at the same time shuts in chloroform, which is a very bad thing; and if present in too large an amount, it may, under the new condition, exercise a fatal influence on the blood. What causes the tongue to fall back? The force of gravity, after the suspension of the power of volition. And in this case its action was increased by the abnormal weight of the tongue. The obstruction was removed, as has been stated, by its displacement.

This is a good example to illustrate the importance of anticipating the operation of causes, and of taking precautions to counteract their effects. In all operations about the mouth, pharynx, and lower jaw, including inflammatory affections of the parts below the latter, it is a good rule to introduce the gag at an early period during induction, and when the tongue is the seat of a growth, to pass a thread through its tip before anæsthesia has caused muscular relaxation.

A useful lesson may be drawn from this complication. It teaches us not to be too much under the thraldom of the "capricious action" of chloroform, whereby the administrator is rendered over-anxious and prone to act vainly. For if artificial respiration had at once been resorted to, much valuable time would have been lost, *i.e.*, the interval (it may be but a few seconds, but these are of the first importance at such a juncture) between the commencement of artificial respiration and the discovery that no air was entering the lungs; because no air could possibly enter the lungs, in this instance, by reason of complete mechanical obstruction. The mouth, then, has to be opened and forced open, because in all instances of mechanical obstruction there is at first spasmodic contraction of the jaw muscles. And the mouth at last opened, and kept open by a gag, the tongue has to be drawn or pressed forwards. Then air enters the lungs, and it may be too late. But if, on the other hand, the true cause be recognised—the operation of a purely mechanical factor—measures are immediately taken to counteract it. The mouth, if not open, is opened at once, the tongue displaced from its dangerous position, whereupon air enters and obviates any further procedure—that is, when chloroform, as in the above instance, is not present in an overdose. Should this latter additional complication be present,

the chest is to be emptied artificially until spontaneous breathing is re-established.

Now, it may be asked, and very properly, Can the arrest of respiration during chloroform-anæsthesia from a mechanical cause be distinguished from respiratory arrest consequent on chloroform poisoning? And the reply is affirmative. When the arrest is due to simple asphyxia, chloroform being present in proper amount, the pupil is contracted and remains contracted (it becomes dilated, and that suddenly, only when the cause, being uncounteracted, verges on a fatal result). *Per contra*, if chloroform be present in an overdose, the pupil is always dilated, the degree of dilatation corresponding to the degree of chloroform narcosis. What is already said of the mechanical factor applies, it will be observed, to its rapid action. It may, however, act slowly, and its operation in this respect will be detailed in Cases II. and IV.

II. A man, æt. 24, had had two previous operations for the removal of necrosed portions of the outer surface and lower margin of the right lower jaw. For some time he had not been able to eat well, and from this cause he had become emaciated. Further, there were some sinuses opening into the mouth, which discharged a fœtid pus. When chloroform was administered at the third operation, he was observed to be pale, with a dilated pupil (probably not all from fear), and lean and flabby muscles. As so often occurs in emaciation, there was struggling, which completely subsided before anæsthesia was achieved with a sensitive, dilated pupil. The pupil remained "sensitive" during the first fifteen minutes, very readily reacting to light and contracting with air, during which the dilatation gradually diminished, and eventually it became pin-point. Twenty minutes from the commencement of the operation it was necessary to exert pressure on the lower jaw. Effort was made to counteract the impediment caused by the depression, but unavailingly. The chloroform had been regularly reduced in amount in accordance with the law of diminishing resistance, so that at the time difficulty in breathing became manifest the patient was taking four drops every twenty seconds. With the difficult breathing, brought about by an encroachment on the upper aperture of the air-channels, the complexion became in a slight degree livid, the pupil commenced to dilate, and the pulse got feebler. This condition remained for about, so far as I could judge, five minutes, during which chloroform was reduced to two drops. The operation was still in progress when respiration ceased, not suddenly,

but in a gradual manner. At this crisis the following phenomena were observed—complexion slightly livid, pupil partially dilated, pulse beating with fair strength. What was done was to pass the forefinger of the right hand along the dorsum of the tongue till its tip touched the epiglottis, to press this finger towards the floor of the mouth, so as to displace the tongue forwards, and to maintain the forward position thus given to the epiglottis by means of counter-pressure exerted by the thumb from the outside and under the left lower jaw. This procedure was followed by spontaneous breathing; the pupil became contracted once more; chloroform resumed, and the operation completed without further complication, but with the tongue and jaw held forward as above described.

The explanation of this untoward event belongs not to the capricious action of chloroform, but to the gradual increase in the amount of CO_2 circulating in the blood; in other words, to oxygen-starvation induced by narrowing of the upper aperture of the larynx. For as soon as oxygen was allowed to enter freely, all the gravity of the case disappeared forthwith. It is instructive to note that, with the first manifestation of impaired breathing the pupil did not dilate. It dilated to a slight degree only when the proportion of CO_2 became excessive and permanent; and while this was taking place, it should be observed that the amount of chloroform was reduced to a minimum, and for a very good reason, because the action of chloroform on the blood is the more injurious the more the vitality of the blood is reduced, as in this case, from want of a proper supply of oxygen.

From a consideration of this illustrative example it is easy to see the difficulty there must be in determining, in similar cases, what is due to a simple mechanical agency and what to chloroform, if the latter be not acting as a "constant" quantity. Nay, without the normal state of anæsthesia, it would be impossible to isolate the causes of the various phenomena which occur at times to complicate its progress. And without the knowledge of these causes we should have no means, or at any rate the safest means, of counteracting dangerous signs at their first appearance. Of what use were it to say that the same amount of chloroform was given up to the critical juncture, when this amount under the new conditions of obstructed respiration and deoxygenated blood was acting as a poison, except to discredit chloroform and ascribe to it some action which it hath not? And again, observe how much depends on the manner of administering chloroform; for if it be added in ℥ss. or ℥i. doses at intervals of one minute, is it not possible that an

addition may unhappily be made just at the very moment when the accumulated effect of CO_2 (assumed to be undetected) is beginning to do its worst, with the result, of course, of very seriously endangering life, if not sacrificing it? Such a possibility, without any doubt whatever, condemns the method, and proves the rectitude of the graduated method, which has for its objects the sparing use of chloroform, the addition of a few drops at frequent intervals, their continual reduction throughout the progress of anæsthesia, and their further regulation according to respiratory complications.

III. A woman, æt. 32, who was known to have a polypus of the pharynx. The history was that she had difficulty of breathing at times during the day, and during the night was subject to attacks of asphyxia. Chloroform was administered, but before anæsthesia was attained there was an attack of asphyxia, out of which the patient extricated herself. A gag was then placed in the mouth and a second attempt made, but a similar proceeding supervened. The patient was conscious at the beginning of these asphyxial attacks, and in the second she was assisted by having the tongue pressed forwards. At the third attempt the administration, which had progressed more kindly, had almost reached anæsthesia when suddenly respiration stopped, the pupil being contracted and the pulse beating strongly. There being no effort at recovery, as in the former attacks, and the pupil beginning to dilate, tracheotomy was performed, and anæsthesia effected through the artificial opening. On examination, it was found that the polypus had become impacted in the upper aperture of the larynx, thus acting as a complete barrier to the entry of air.

The point of interest in this case is the power which the patient had of displacing the tumour when it encroached upon the air-passage. During sleep, either by the action of gravity or moved by the current of air, the polypus was prone to be caught in the upper laryngeal aperture, and asphyxia causing the patient to awake, she was able to rectify the mischief, and even during partial consciousness she had some control over its position; but when consciousness was lost, or nearly so, it remained impacted when it was caught in the air-passage.

IV. A little boy, æt. 8, with a cleft of the soft and part of the hard palate. In a fairly good state of health. Chloroform by the graduated method. The induction of anæsthesia was normal, and when a Smith's gag was introduced the pupil was

contracted; but when the gag was opened, the breathing became difficult, and remained so despite the aid given by raising the jaw. Breathing stopped, and it was then observed that the tongue, which was unduly large, was engaged in the palatal gap, with the base pressing against the posterior wall of the pharynx. The gag was at once removed and respiration proceeded; in the interval of impeded and arrested respiration there was no dilatation of the pupil. A second attempt was made, the tongue being well advanced, but the result was the same. The operation was effected by an ordinary (Coleman's) gag, a cheek retractor, and a tongue depressor. The lower jaw was raised and kept in a forward position by means of the forefinger of the left hand. The pupil continued small throughout, and there was no further complication.

In all operations involving the use of a gag, it should be the first concern of the chloroformist to see that the breathing be free. It is not sufficient that it be continuous, it must also be efficient. Breathing may be continuous, but shallow in some degree, and unequal to discharge its function of properly oxygenating the blood; and so gradually may this complication creep along, that it may not be detected until its effects have assumed grave dimensions. Sometimes, indeed, in its progress the extraordinary muscles of respiration are brought into play to cheat the observer.

Now this is an extreme instance; but when the mouth is widely opened—and all gags err in this respect—there is always some degree of respiratory obstruction, and knowing the profound danger of the action of chloroform on blood in which CO_2 is ever accumulating, how are we to recognise the true state of affairs if perchance we have falsely argued from the character of the respiration? By the gradual onset of duskiness of the complexion and commencing dilatation of the pupil. These ought never to fail, if constant watch be kept on the patient's face, and the pupil examined whenever an addition of chloroform is made. Should these signs of danger be present, remove the lint, let the patient breathe air only; find out the cause of partial respiratory obstruction, and henceforward counteract it by forcibly raising the jaw. But before you continue with chloroform you must wait until the pupil becomes contracted.

On a few occasions the size of the tongue also affords an obstacle to free respiration, as in the case before us. When it does so, the posterior third must be depressed, and kept depressed during the operation. In all operations in which the mouth is widely opened, it is necessary for the purposes of

efficient breathing not only to keep the lower jaw supported, but also from time to time to close the mouth. The influence of these practical details will become at once manifest when respiration with the jaw supported to counteract depression is compared with that of the depressed jaw, and both with the mouth shut.

In the case above related there was no dilatation of the pupil. Why? Because the accumulation of CO_2 was not allowed to reach that degree of CO_2 poisoning associated with a dilated pupil. The harm done was inappreciable, just as in a temporary overdose of chloroform, when it is carried not beyond the first stage of narcosis, as happens at times when patients are subjected to its action in the process of "getting them under," as it is commonly called. Where injury is done is in allowing these agents, CO_2 and chloroform, to circulate in a less or greater degree of excess for a lengthened period of time. And the injury consists in depriving the tissues of their due and proper nourishment, whereby they lose with less or greater rapidity their vitality. If the patient's tissues be initially enfeebled, it is clear that under these abnormal conditions they would be still more dangerously affected than healthy ones.

V. One of the commonest forms of mechanical obstruction with which we have to deal is that of dropping of the lower jaw, and it is favoured by some peculiar configuration of it. It is frequent in the very young, the very old, and those who are emaciated. In long operations, too, it tends to complicate the later periods of anæsthesia. Primarily it depends on muscular relaxation; the jaw drops, and with it the tongue, at the base of which is the epiglottis. As the effect of this falling or dropping of the jaw, the relation of the epiglottis to the upper aperture of the larynx is altered, so that a narrowing of that aperture results. It is remedied either by raising the jaw or by pushing it forwards at the angle. The following case illustrates this kind of mechanical obstruction very well.

A young adult, æt. 20, had, as the consequence of a fall on to his neck, paralysis of movement and sensation of much of his right upper limb. The diagnosis was rupture of some of the cords of the brachial plexus close to their exit from the spine, and an operation was devised to unite them. Chloroform was administered, because it was believed the operation would be protracted, and in such cases it is prudent to consider the powers of one's patient. Everything went well for an hour, and the divided cords were in process of being united, when

the pupil became slightly dilated, the complexion faintly dusky, in spite of the fact that the anæsthetic had been gradually reduced according to the law. But the pulse was not appreciably affected, and it kept a good strength throughout. The lower jaw was raised and kept raised, and very soon the pupil returned to the state of contraction, and the slight degree of duskiness was replaced by the normal colour of the complexion. The operation was completed in one hour fifty minutes, without any further abnormal occurrence. The patient was conscious in seven minutes, and made an uninterrupted recovery.

This instance shows the necessity for close observation, and the "constant watch" is rewarded with the detection of injurious signs at their inception; for no one will doubt the injury done to nutrition by the gradual and continuous accumulation of CO_2 in the blood, which renders all the tissues of the body weak, and the cardiac muscular fibres with the rest, and thus defeats what should be the paramount concern of the chloroformist—the keeping of the blood in as normal a state as is possible under the conditions of anæsthesia. But when the heart becomes feeble from this cause, see how great is the tendency to ascribe it to the influence of chloroform! But it is an erroneous conclusion, and arises from the fault of not surveying all the forces which are in action at the moment an "effect" is observed. Chloroform has its sphere of action, and its degree of action is limited by the normal state of chloroform-anæsthesia. Should there be any departure from this normal, we must first of all be assured that no abnormal conditions are present before we can correctly refer it to the sole operation of chloroform. If abnormal conditions be present, clearly we must determine their nature and causation; and among these causes is mechanical obstruction to breathing. So important is the influence of this factor, that no record of the action of chloroform should be taken as valid unless the air-channels are known to be free from obstruction.

The range of the mechanical factor is thus displayed; and it has been my object to demonstrate that respiratory obstruction, the more particularly when it is slowly induced, has effects of its own which may simulate those of chloroform, and for which they may be mistaken. But there are other causes beside that of the mechanical factor which have effects of their own, independent of the action of chloroform, though they are merged in it. Notably amongst them is stomachic perturbation. And it is, I believe, from the imperfect analysis of causation that there exists the perplexity and widely separated views

pertaining to chloroform. To obtain clear and distinct ideas of the action of this anæsthetic, we must enumerate all the causes operating with it, and isolate as accurately as we can their effects. Only thus shall we avoid the error of ascribing to chloroform what is, in reality, not of chloroform.

PHYSIOLOGICAL ASPECTS OF DISEASE.

BY

HARRY CAMPBELL, M.D.

§ 1. Disease being an abnormal mode of life, we should not expect abnormal metabolism to be wholly different from normal metabolism. The former cannot be regarded as *sui generis*. Thus the nervous discharge in a convulsion is much the same as in a normal muscle-contraction; and the effusion of fluid, migration of corpuscles, and division of fixed cells observed in inflammation have their physiological counterparts. Indeed, the kinship between normal and abnormal metabolism is now so well recognised that further insistance upon the point is unnecessary.

§ 2. An organism afflicted with a disease is continually striving to regain the normal, and, where this is impossible, to minimise the ill-effects of that disease. In so doing, it displays powers of *adaptation* and *adaptability*, and many of the phenomena of disease are manifestations of these essentially physiological attributes.

The words in italics require to be defined. Every normal organism is hereditarily adapted to a certain environment—*i.e.*, by virtue of inherited structure it has the power of acting in correspondence (as Herbert Spencer would say) with that environment, therein displaying its power of *adaptation*; and it is further capable of becoming adaptively moulded to alterations in its environment. This property we may term *adaptability*, and it may be defined as the property possessed by an organism of becoming so moulded (=structurally altered) by alterations in the environment as to remain adapted to the environment thus altered. The power of adaptation is the actual, that of adaptability the potential power—the power of becoming adapted; and it is one which, as I have elsewhere insisted, has needed a special evolution.[1]

Let us now inquire how far these two properties are displayed

[1] See "Differences in the Nervous Organisation of Man and Woman." Lond. 1891, p. 60 *et seq.*

in disease. Though somewhat difficult, it will conduce to clearness if we attempt to treat of each separately.

Adaptation as Displayed in Disease.—Many diseases are directly traceable to environmental agencies, and in its effort to battle against these the organism often displays a remarkable capacity of adaptation. Inflammation is a case in point. Though long thought to be a purely morbid process, it is now known to be adaptive, and we must regard the ability of the tissues to inflame as essentially physiological. I can only very briefly touch upon this interesting subject. Inflammation is generally excited by a chemical irritant, the most common source of which is a parasitic micro-organism. Now one of the most striking phenomena of inflammation is the migration of leucocytes, which play an important part in bacterial destruction. Mr. Jackson Clarke, in a recent communication to me, refers to this *phagocytosis* as "the most dramatic and striking feature of inflammation as a protective process. Let us for one moment imagine," he continues, "what would happen if the entrance of viable organisms into the body were not followed by inflammation. The fungi, carried to all parts of the body, would so increase in numbers that their secretions and excretions would cause death from toxæmia; or supposing this to be compensated for by increased activity of the kidneys, the mechanical pressure exerted by the increasing swarms on the cells of the brain and cord would alone suffice to cause death." So far, then, the phenomena of inflammation are essentially adaptive. But what good purpose, it may be asked, is served by the fluid exudation? It probably constitutes a nutritive and circulatory medium for the phagocytes. Without a considerable exudation of fluid these latter would be unable to move about with the necessary agility. The increased exudation also helps to increase the tension of the tissue-plasma, and this serves the double purpose of forcing pus cells —*i.e.*, such of the phagocytes as are not digested by fixed cells— into the lymphatics, whence they are conducted to the nearest lymphatic glands, being therein entangled and dealt with in a manner that need not engage us here; and of favouring the discharge of an abscess (should one form) upon a surface, and the consequent escape of noxious pus from the body.

One of the commonest and most obtrusive symptoms of acute disease is fever, and this is apt to be regarded as a wholly morbid phenomenon. It may, however, for aught we can tell, be an adaptive reaction. It is, in fact, possible that an organism not capable of pyrexia would fare much worse when exposed to fever-provoking parasites than one that is. It has

indeed been suggested that the fever caused by micro-organisms is an aid to their destruction, and that the ability to become febrile in response to a parasitic onslaught has been acquired by natural selection.[1] It is true that certain evils result from fever, but it is probable that, except in the case of hyper-pyrexia, these are for the most part outweighed by the advantages accruing therefrom. It is very possible that the heightened activity of the circulation in fever is an adaptive reaction serving a useful purpose, and that an individual in whom fever did not accelerate the blood-flow would be at a disadvantage in combating febrile disease. If it be objected that protracted fevers weaken the circulation, the reply is that in by far the majority of fevers the individual has mastered the parasite before this occurs, and is suffering from the injuries it has caused rather than from those it is causing.

Again, the high arterial tension in Bright's disease has been thought by Broadbent to serve a useful purpose, seeing that, when the tension is low, the prognosis does not appear to be so good; and if such is the case, we must regard it as a physiological adaptation.

A further phenomenon of disease, possibly to some extent adaptive, is shock. It does not seem improbable that it may tend, in some way, to lessen the ill effects of the injury causing it. L. Hill has ingeniously suggested that fainting may have served a useful purpose in the past, by causing the individual to lie as one dead, and thus escape detection by the enemy; and he further points out that the posture assumed in a faint is the one best calculated to restore consciousness, by causing a flow of blood to the brain.[2]

Among other adaptive phenomena of disease may be mentioned the rapid breathing of fever, the shallow thoracic breathing of acute peritonitis, the partial ptosis of myopia, the various postures assumed in disease, *e.g.*, in heart disease and in the asthmatic paroxysm, and such phenomena as coughing, vomiting, excessive sweating, and that most terrible accompaniment of disease—pain. This is essentially adaptive, and therefore physiological. It benefits in a threefold way: (*a.*) It directs attention to the seat of pain, and thus prompts to the removal of its cause, be it an impacted thorn, a chafing boot, a carious tooth, or what not. (*b.*) It acts as a deterrent, leading to avoidance of the causes, which are always injurious. It may here be observed that those who are very sensitive to

[1] Dr. Pope of Leicester made this suggestion in the discussion on the treatment of fever at the annual meeting of the British Medical Association held at Bristol, 1894.
[2] Journal Physiol., 1895.

pain—the hyperæsthetic—are more likely than those of blunter sensibility to avoid its causes, and consequently to lead healthy lives. They are apt to be very careful of what they eat and drink, and to avoid excitement and fatigue. It is partly for this reason that very sensitive persons who are always complaining of their health, often live to be old, while their opposites, those who "have never known a day's illness," not seldom die prematurely, in consequence of long-continued excesses, indulged in with apparent impunity; the one class is tied down to a healthy mode of life, while the other is often lured on to an unhealthy one. (*c.*) Finally, pain tends to secure rest of the painful part, and this is practically always beneficial to it. Thus in fracture of a limb, the pain produced by movement tends to secure the rest needful for the healing process. Similarly the agony of acute articular rheumatism certainly does some good by ensuring rest of the affected joints. Compare the effect of acute rheumatism on the heart and on the joints. It is probable that the morbid process is the same in two cases, and yet how much more disastrous it is in the one than in the other. For while acute rheumatism in the vast majority of cases leaves the joints perfectly sound, the cardiac structures, when once attacked, are permanently damaged. There can be no doubt that this difference is due to the facts that the affected joints are kept in absolute rest, while the heart and pericardium, being in a state of incessant movement, are not able to secure the rest needful for the complete resolution of the inflammation. And is it not a remarkable fact in this connection that while the inflammation in the one case is attended with acute agony, in endocarditis and myocarditis[1] pain is conspicuous by its absence? For what good purpose could it serve?

Headache is another instance of pain securing needful rest; it brings rest to the mind, and one subject to headaches is less liable to suffer from an overtaxed brain than one who never gets them, the latter being more liable to tax his brain beyond physiological limits.

Headache, however, is frequently redundant, and this leads me to refer briefly to the defects of pain as an adaptive agency. On the one hand, it may be absent when its presence might be serviceable, and on the other hand it may be excessive; for not only may it occur when it can serve no useful purpose, as in tumour of the brain, but in cases where it might be of service, it may be in excess of what is needful to secure any of the three advantages given. All pain, and especially excessive pain, is

[1] In pericarditis, however, pain is present.

prostrating, and is so far injurious. Thus the excessive intensity of the pain in acute rheumatism, with the attendant prostration, is recognised in the treatment of the disorder by salicylate of soda.

With pain may be classed the sensation of malaise. It attends many diseases, especially the more acute, and it is essentially adaptive, tending, as it does, to secure the rest so helpful to recovery. In its more marked forms it amounts to prostration and absolute inability to get about, and is thus a blessing in disguise. It is certain that a person's chances of complete recovery from an acute illness would be jeopardised if he felt perfectly well all through it. Instance such a disease as typhoid fever.

Periodic attacks of malaise may accompany minor ailments, and may benefit by securing rest to mind and body, above all, perhaps, to the digestive viscera. Thus the anorexia which attends so-called bilious attacks is a beneficial arrangement, ensuring a much-needed rest to the organs of digestion.

Adaptability as Displayed in Disease.—The ability of the organism to undergo, in response to altered conditions, structural changes which shall fit it to those altered conditions, is quite as remarkably displayed in disease as in health.

Hypertrophy of the heart, once thought to be itself a disease, is now known to be an effort against the evil effect of disease,[1] but it is not so generally known that the same may be true of cardiac dilatation. Nevertheless, the left ventricular dilatation in aortic and mitral regurgitation, and the left auricular dilatation in the latter disease, are, within certain limits, entirely compensatory.

I have elsewhere pointed out that the so-called "button-hole" and funnel-shaped orifices met with in obstructions of the auriculo-ventricular and sigmoid rings, facilitate the flow of blood through the narrowed orifice.[2] They afford a remarkable instance of adaptability.

The hypertrophy of the left ventricle which occurs in chronic Bright's disease is compensatory, as is also (probably) the thickening of the arteries, and it need scarcely be said that all forms of compensatory hypertrophy are adaptive. We may further cite the hypertrophy of the bladder from obstruction of the urethra, or of a duct from blockage of it; the hypertrophy of one kidney or lung, from disease or destruction of its fellow, and the remarkable hypertrophy of certain groups of muscles in consequence of paralysis of certain others.

[1] I exclude from consideration the physiological hypertrophy of athletes, &c.

[2] Lancet, 1894.

Other instances of adaptability are the formation of false joints, the abundant deposit of sub-periosteal bone on the concave side of rickety long bones (by which means further bending tends to be prevented), and the wide-spread skeletal change wrought by angular curvature.

The formation of fibrous tissue constitutes one of the secondary beneficial results of inflammation. It may serve to localise disease. Thus a foreign body—a bullet, for instance—may be encapsuled in fibrous tissue, and in this way rendered inert, and an abscess may in like manner be localised. Similarly the escape of the gastric or intestinal contents into the peritoneal cavity through a perforation may be prevented by fibrous adhesions. These are all instances of adaptability—of the ability of the organism to become structurally improved in relation to new conditions.

Adaptability is displayed in more subtle ways. Thus an organ, such as the skin, may learn to act vicariously, and probably vicarious action plays a large part in enabling the organism to adapt itself to the new conditions imposed by disease. Doubtless the adaptability of the organism in this respect is very considerable.

§ 3. No complex organism—certainly no human being—can pass through life entirely free from disease. Much of this disease is due to inherited defect, and much to noxious environment: many individuals inherit a tendency to serious disease, and all are sooner or later exposed to pathogenic environments. Hence disease is inevitable. Suppose, however, an individual, as free from inherited morbid tendencies as it is possible for one to be, placed in a theoretically perfect environment: would he still have disease? It is practically certain that he would occasionally suffer from minor disorders; and granting that such is the case, are we to regard such disorders as evidence of organic imperfection—of evolutionary failure? or is it possible that they may serve some good end—that they are not altogether an expression of ineptitude, but quasi-pathological rather, leaving behind a higher level of health, or warding off some much more serious disease?

This is the chief point I wish to raise in this paper, and the one, in fact, which suggested the writing of it.

It is true we often hear of men of exceptionally good constitution and leading exceptionally healthy lives, who have never, so they say, had a day's illness, and it is quite possible that they may never within their memory have been incapacitated from work; but careful observation will certainly disclose the occasional occurrence of slight ailments in such. In the exuberance of their wonted health they forget these occasional upsets,

stoutly denying that they are ever ill. The observant and solicitous wife, however, tells a different tale. Not only can she accurately describe these minor attacks of ill-health, but she is often able to prognosticate their on-coming by signs well known to her—from the facial expression, the occurrence of irritability, and so forth; and, what is more to the point, she will tell us she has noticed that *they are followed by periods of unusually good health.*

I shall not stop here to discuss the nature of these minor disorders: many of them are connected with the digestive viscera, and they differ in different individuals. Nor shall I attempt to explain *how* they benefit; whether, for instance, by causing a discharge of noxious matters (by vomiting, diarrhœa, the copious elimination of toxines), or by ensuring rest to certain parts.

It may of course be argued that, even if we allow the existence of such quasi-pathological diseases, they are an expression of organic ineptitude; that the same good ends might, theoretically at all events, be achieved without the intervention of disease—that is to say, by a purely physiological process. The reply to this is, that evolution is ever ready to secure an ultimate advantage, no matter by what means, and thus a tendency to certain minor disorders might be implanted, if thereby the survival of the individual is secured.

§ 4. It sometimes happens that one disease mitigates or actually removes another, and to this extent it may be said to act physiologically. Thus a sufferer from eczema rimosum contracts influenza, and the eruption completely disappears; a patient who for years has been a martyr to "rheumatism" develops cancer of the liver, and the rheumatic pains forthwith vanish; a third, who is the subject of paralysis agitans, has hemiplegia, the tremor thereupon disappearing, and not returning even after the almost complete recovery from the hemiplegia. There is, in short, an antagonism between certain disorders.

Closely allied to this phenomenon is metastasis, or the advent of disease in one part concurrently with its disappearance from another. How far the former causes the latter, or the latter the former, it is difficult to say; but it is probable that in some cases at all events, the occurrence of disease in one part is the cause of its disappearance from the other, which is thus far physiologically affected. A good instance is the removal of headache by a severe lumbago.

Counter-irritation acts in a similar manner. A strong impression artificially made upon one part beneficially modifying

another and diseased part, and thus acting physiologically upon it.

Sometimes the ultimate effect of a disease is to raise the level of health—to impress the organism physiologically. In some cases the good effect is accidental. Thus health may be improved by the specific fevers and other grave disorders. No doubt the long rest to mind and body and the careful dieting which they bring about, may help to compass this happy end; but I believe that in many cases the good effect is rather the result of a specific impress left upon the organism by the disease. It is indeed possible, as I have suggested in § 3, that this is the essential purpose of some minor diseases, which, on the assumption, would have to be regarded as quasi-pathological.

§ 5. Sometimes, paradoxical as it may seem, a disease may, if we judge by the feelings and capacities of the individual, temporarily improve health. In such cases the general effect is rather physiological than pathological, for the time being at all events. Instance the incubative period of scarlatina. Is this not often a period of exceptionally good health? The same is true of the period immediately preceding certain nerve-storms, such as asthma and megrim. But perhaps the most interesting instance of disease leading, in its earlier phases, to a general mental and bodily exaltation, is general paralysis of the insane. Recent history has afforded—so it has seemed to me—a most extraordinary instance of this. By the way, has the part which disease has played in history been sufficiently appreciated? Apart from the fact that many persons attain to powerful positions actually by virtue of their possessing quasi-pathological minds, there is also to be taken into consideration the fact that different diseases mould the mind, and thus the conduct, in different ways. Now, once a person has achieved a position, it takes a long time to dislodge him; he generally retains it till some time after middle life, when such diseases as granular kidney and degenerative nervous disorders (all of which probably have a definite influence upon the mind, modifying the whole character of the man) are common. I have seen some remarkable illustrations of this.

Postscript.—In an address on "Reparation" (British Med. Jour., vol. ii. 1895, p. 1601) Dr. Wilks has dealt with one of the physiological aspects of disease I have discussed in § 3. I regret I had not the advantage of reading this address before writing my paper.

CASE OF

STRANGULATION OF A LOOP OF SMALL INTESTINE IN THE FOSSA INTERSIGMOIDEA.

BY

W. McADAM ECCLES.

The passage of intestine into the intersigmoid fossa and strangulation by the margins of the opening is a rare occurrence, and the following case is therefore worthy of record.

A man aged 53 was admitted into the West London Hospital under my care on August 18, 1895, suffering from well-marked symptoms of intestinal obstruction. He gave the following history of his illness:—For many years he had suffered from double inguinal hernia, for which he had worn a truss, and the instrument at most times answered its purpose satisfactorily. Both herniæ were easily reducible. On August 14, four days before admission, whilst he was coughing, the left rupture came down, and he found he was unable to reduce it. He says it felt very hard and was very tender and painful. Soon after its protrusion he began to vomit, and nothing passed per anum; the pain also increased in severity at the seat of the hernia, and spread to the abdomen.

He was soon after taken to the Cottage Hospital near where he lived, and admitted. He was seen by the surgeon with very little delay, and after some considerable difficulty the hernia was reduced by taxis.

The vomiting and the pain, however, still persisted, and his bowels were only slightly opened by an enema, neither fæces nor flatus passing naturally.

The pain did not subside, and the vomiting, which at first only came on after attempts to take food, occurred much more frequently.

All the symptoms continued up to the time of his admission into the West London Hospital.

He then exhibited the following symptoms:—His face wore an anxious expression, and was also in other ways typical of

acute abdominal disturbance. The pulse was small and frequent. His breathing was markedly thoracic. The tongue rather dry and thickly furred. Temperature 98.2° F. The abdomen was full, being evenly distended, and everywhere resistent. No local swelling or induration could be made out. A resonant note could be elicited over the whole surface.

Both inguinal regions were empty, no thickening of any kind could be made out, but on invaginating the scrotum both external rings were found to be much enlarged, and the inguinal canals could be easily entered and were discovered to be empty. There was no swelling in either femoral region. The patient vomited after admission, and the ejected matters had a distinctly fæculent odour. The urine was normal.

Seeing that there were evident symptoms of intestinal obstruction, and that nothing could be palpated in the hernial regions, I decided to explore the abdominal cavity by a median laparotomy, rather expecting to find the results of a reduction *en masse*.

After the patient had been placed under the influence of ether, an incision in the middle line was made of some four inches in length below the umbilicus. The abdominal wall was fairly well nourished and rather hyper-vascular. On opening the peritoneal cavity, blood-stained odourless fluid escaped. The left iliac fossa was explored. The left internal abdominal ring was not occupied by any protrusion and admitted the finger.

Lying, however, rather higher up in the fossa, and at the posterior part of the abdomen, was a firm resistent mass, into which could be traced small intestine, one part of which was distended and the other collapsed.

It was plain that this constituted the seat of obstruction.

A closer examination revealed a tightly constricting edge, which afterwards proved to be the margin of the aperture of the intersigmoid fossa.

The tight sharp ring was carefully snipped with a pair of scissors, and the gut slowly drawn out of its grasp.

A loop of small intestine was thus liberated, which was intensely congested with a length of about half-an-inch in its middle, black and gangrenous.

The whole loop measured about four inches, and it was brought out of the abdominal wound.

Two pieces of rubber drainage tube of small calibre were passed through the mesentery, close to the intestine, at points which were some three inches beyond the congested part on either side.

The gangrenous piece of bowel, with the œdematous portion, was entirely excised, together with a V-shaped piece of mesentery. The contents of the upper dilated portion of small intestine were allowed to freely escape through the open end, and when fairly empty the rubber tube was drawn tight and secured at both places.

The extremities of the healthy bowel were now united by Maunsell's method.

The loop being washed and returned, the peritoneal cavity was sponged out and the abdominal wound closed.

The patient stood the operation, which lasted fifty minutes, very fairly well, and rallied afterwards.

The vomiting and pain, however, recurred some six hours after the patient returned to the ward, and he died of exhaustion about twelve hours later.

The post-mortem examination showed some general peritonitis, most marked in the region of the sigmoid flexure, which was itself thrown over to the right side of the body. There were no evidences of old peritonitis in the form of adhesions, all the inflammation present being of a recent nature. The sutures used in the anastomosis had held well, and there was but little distension of the gut above the resected portion.

The unsuccessful termination of this case was not unlooked for, the occurrence of gangrene of the bowel being always of the very gravest import. The method used for the intestinal anastomosis is certainly one which is very efficient, and remarkably easy and rapid in its accomplishment. This patient, like so many others, really perished for want of early surgical interference when there were persistent signs of strangulation.

The fossa intersigmoidea is formed in the meso-sigmoid, and has its aperture on the under surface, or, more strictly speaking, on the left side of this portion of the mesentery.

This fossa was distinct in at least half of the subjects examined in the Rooms during the years 1892–94, the exact percentage being 53. This accords almost exactly with the researches of Mr. Treves, who gives 52 per cent. as his results.

In the fœtus the fossa is undeveloped. The sigmoid artery passes obliquely down from the inferior mesenteric artery behind the peritoneum, then enters the meso-sigmoid, and there breaks up into several branches. In its course in the mesentery it makes a well-marked fold, which can usually be clearly seen even if no fossa be present. When the fossa is in existence the fold is accentuated.

It seems probable that after birth the length of the omega loop increases, with a corresponding development of the meso-

sigmoid, but not accompanied by a contemporaneous elongation of the sigmoid artery. A slight depression is thus produced by the meso-sigmoid being drawn up, and this may subsequently be developed into a well-formed fossa. As far as I have observed, subjects having a short meso-sigmoid—that is, one less than two inches from the parietes to the bowel—have but poorly marked intersigmoid fossæ, and conversely those with a long mesentery to the flexure have deep fossæ; but further observations on this point would be interesting.

The fossa itself is most commonly placed at the point where the mesentery of the omega loop lies over the division of the left common iliac artery, and therefore just internal to the left psoas magnus muscle.

Frequently, if there be but little extra-peritoneal fat, the left ureter may be seen through the layer of peritoneum forming the floor of the pouch.

The sigmoid artery usually lies above the fossa and to its right; if there be more than one sigmoid artery, as is not infrequently the case, the fossa is shallower than ordinary.

The pouch, which, as it will be easily understood, varies very considerably in depth, being seldom more than one and a half inches long, has its direction downwards and towards the left.

The margins of the orifice are very sharp, and form an oval or round aperture, admitting in the majority of cases the last phalanx of the forefinger. These margins are commonly devoid of any blood-vessels.

In some much rarer instances the fossa is of considerably larger size, and it is probably always so in those cases in which strangulation of the bowel takes place within it.

According to Mr. Treves, the fossa is not infrequently obliterated by adhesions. The but rare occurrence of a prolapse of bowel into, and strangulation by the edges of the opening of the fossa, is, as has been pointed out by Waldyer,[1] due to several reasons.

Firstly, in the normal position of the sigmoid the mouth of the fossa is placed out of the way of the coils of small intestine, and it is only when the loop happens to be thrown over to the right that its opening tempts prolapse into it. Secondly, the fossa itself is only occasionally large enough to contain a knuckle of intestine. Thirdly, the margin of the aperture has a tendency to act as a valve, so closing the entrance.

Strangulation in the fossa duodeno-jejunalis appears to be rather more frequent than in the intersigmoid fossa.

[1] Virchow's Archiv, Band lx. S. 66.

The following points are of interest in connection with the case under consideration: there was no undue lengthening of the meso-sigmoid, a condition which, as has been stated above, seems to tend to make the fossa deeper. There were no adhesions produced by old peritonitis which might have led to the formation of a spurious fossa,; in fact, the absence of adhesion even about the left internal ring is somewhat remarkable, seeing the patient was the subject of a left scrotal hernia of some standing.

The tightness of the strangulation was extreme, showing that once a loop of bowel has become imprisoned it will be very seriously affected in a comparatively short while; hence the necessity for an early exploration in cases where the diagnosis of internal strangulation is obscure.

The ease with which Maunsell's method of resection and anastomosis can be effected, especially when the proximal portion is dilated, is an important factor in the choice of a method for dealing with such cases; and it is obviously suitable for instances where a junction of two divided ends of intestine has to be made in the absence of any special mechanical apparatus.

The fatal result in this case was in no way, in my opinion, due to the method employed, but rather to the late period at which the operation had necessarily to be undertaken.

I have to thank my late House-Surgeon, Mr. R. Shepard, for the notes of the case, which he so ably took.

THE RELATIVE FREQUENCY OF TUBERCULOUS INFECTION OF THE LYMPHATIC GLANDS IN CHILDREN.

BY

FREDERICK E. BATTEN, M.D.

Tuberculous Infection in Children.

The object of the following paper is to point out (1) the relative frequency of infection of the various lymphatic glands in children; (2) the more frequent infection of the thoracic glands, and the greater liability to infection of the glands on the right side of the thorax, and the consequences resulting therefrom.

The starting-point of tuberculous disease in children is a matter of considerable interest, and the primary infection of the lymphatic glands has been frequently discussed, Dr. Sims Woodhead[1] laying stress upon the frequent infection of the mesenteric glands, while papers by Dr. Colman[2] and Dr. Carr[3] point to the more frequent infection of the thoracic glands. Recently more attention has been given to infection through the tonsils.

It is my intention in this paper to deal with the relative liability to infection of the various glands of the body.

The source from which my statistics are derived is the same as that from which Dr. Colman obtained his series of cases, and is taken from the post-mortem records of the Children's Hospital, Great Ormond Street, during a period of nearly eighteen months, when, out of 290 post-mortems, 100 occurred in which tubercle was found in the body; that is to say, tubercle was present in slightly over one-third of all cases which came to post-mortem. This agrees almost exactly with the percentage found by Dr. Colman.

[1] Laboratory Reports, College of Physicians, Edinburgh, vol. i.
[2] British Medical Association, Newcastle, 1893.
[3] Medical Society, 1894.

Of these 100 cases, 25 died of diseases other than tuberculosis—diphtheria accounting for nearly half the deaths of this class. Of the remaining 75, 40 died of intracranial tubercle; 26 died of tuberculous disease of the lungs; and 9 died directly of abdominal tubercle.

The following table shows the frequency of infection of various organs and glands:—

TABLE I.

	Per Cent.
Lungs	83
Thoracic glands	83
Mesenteric glands	63
Intestines	49
Brain and meninges	47
Peritoneum	19
Cervical glands	14

In order that the conditions under which the following statistics have been compiled may be clearly understood, the following table is appended, showing—(1.) The number of deaths occurring at the various ages. (2.) The cause of death at the various ages. (3.) The percentage of deaths.

TABLE II.

Age.	No. of Deaths.	Per Cent.	From Intracranial Tubercle.	Per Cent.	From Thoracic Tubercle.	Per Cent.	From Abdominal Tubercle.	Per Cent.	Other Causes.
Under 12 months	14	71	4	35·2	6	30	1	10	3
,, 2 years	22		12		5		2		3
,, 3 ,,	21		7		7		1		7
,, 4 ,,	14		2		3		3		5
,, 5 ,,	7	28	4	53·5	...	14	...	7	3
,, 6 ,,	5		3		1		...		1
,, 7 ,,	5		2		3		...		...
,, 8 ,,	6		4		...		1		1
,, 9 ,,	3		1		...		1		1
,, 10 ,,	2		1		...		...		1
,, 11 ,,	1		...		1		...		...
Total	100		40		26		9		25

There are included in the above figures six children under the age of six months, one child being only three months old; and it should be mentioned here, as possibly affecting these statistics, that, owing to a rule of the Hospital, only a limited number of

children under the age of two years of age are admitted, these being the most urgent cases. This would seem to me to raise the mortality of children under two years of age too high. Dr. Colman, however, argues in the reverse way, and points out that the mortality is probably higher, as many children who die of tuberculosis are not admitted owing to their age.

In the above table the following points are noteworthy :—

(1.) The high percentage of deaths below the age of four years.

(2.) The frequent termination of such cases by meningitis.

(3.) The greater percentage of deaths from meningitis above the age of four than below that age, while the reverse is noticed with regard to deaths occurring from thoracic and abdominal tubercle.

Relative Frequency of Infection of the Various Thoracic Glands.

It is to this point that my attention has been especially directed, and the following figures show that the glands on the right side are more liable to be infected than those on the left. The special liability to infection of the right lung in adults was pointed out by Lænnec,[1] who states that the right lung is more frequently affected than the left. M. Louis is of opinion that the left side is more often affected than the right. Dr. Carmichael Smyth, in a summary of cases recorded by Bonetus, Morgani, and others, states that the left side is more frequently affected than the right. Dr. Williams[2] gives figures showing the right side to be more frequently affected in the earlier stages, and suggests that infection takes place more frequently in the right lung, but advances more rapidly in the left.

The glands in the thorax that have been the subject of special observation are—

(1.) The gland at the bifurcation of the trachæa.

(2.) The glands at the root of the lung, lying between the divisions of the bronchi.

(3.) The glands situated to the right and left of the trachæa, below the sterno-clavicular articulation.

The following table shows the relative frequency of infection of the glands above mentioned :—

Table III.

No of Cases.	Bifurcation Gland.	Root Glands, Right.	Root Glands, Left.	Trachæal Gland, Right.	Trachæal Gland, Left.
83	67	59	48	36	19

[1] On the Chest and Auscultation, p. 282. [2] Pulmonary Consumption, p. 320.

In 83 cases out of the 100 did the glands in the thorax show evidence of infection, and the above table shows that the glands most liable to infection are those situated at the bifurcation of the trachæa, and it also demonstrates the fact that the glands situated at the root of the right lung and to the right of the trachæa are more liable to infection than those on the left. The actual difference in number between the two sides is not great as regards the glands at the root of the lung, but it should be remembered that the above table is only one of actual infection, so that though on the one side the glands may be extensively infected, while on the other only a few centres of infection may be found, yet such a fact is not brought into consideration, and the relative amount of disease in the glands is demonstrated by the condition of the right lung, which in many cases is consecutive to the caseation of the gland. To this point I shall refer again below.

In two cases only was the right trachæal gland the only one affected, in all other cases some other intra-thoracic gland was infected.

On the left sides these glands were never infected without other glands in the thorax being infected.

Ulceration through Wall of Bronchus.

In further proof of this more frequent and extensive infection of the glands on the right side, it is especially interesting to note how the lung becomes directly infected from a caseous gland.

Four cases have been published by Dr. Gee in the St. Bartholomew's Hospital Reports, vol. xiii., under the heading "Chronic Pneumonia, which attends Diseases of the Trachæal and Bronchial Glands."

Of these four cases, three occurred on the right side and one on the left; in three there was ulceration into the bronchus, while in the fourth there was no ulceration.

Such a pneumonic condition of the lung is, I believe, most frequently caused by the rupture of a caseous gland into the bronchus, setting up a pneumonic condition of the lungs, which, in its later stages, first becomes caseous, and afterwards breaks down with the formation of numerous cavities.

Out of the 100 cases, this condition, *i.e.*, ulceration of a caseous gland through the wall of the bronchus, was present eleven times.

In seven of these eleven cases the whole lung was consolidated, while in the remaining four one or more lobes were consolidated,

depending apparently on the situation of the ulceration, *i.e.*, whether it occurred before or after the secondary division of the bronchi.

In seven other cases there was a similar condition of consolidation of one lung, but in these cases no ulceration of the bronchus could be found.

Now, though there was so extensive disease of the lung on the one side, yet in nearly all these cases the affection of the lung on the other side was comparatively slight—that is to say, in three the other lung escaped altogether, in 14 others the opposite lung was affected, and in one extensively affected. Further, out of these 18 cases the right side was affected fourteen times, the left side four times, corresponding with the observations already made that the right side is more liable to infection than the left.

The glands which are most frequently accountable for the condition are those at the root of the lungs, but in a few cases the condition is due to the gland at the bifurcation of the trachæa.

Ulceration into the Œsophagus.

It occasionally happens that the same gland which ulcerates into the bronchus also ulcerates into the œsophagus, and this condition was found in four cases; in each of these it was the bifurcation gland which had ulcerated into the œsophagus as well as into the bronchus.

In three cases the opening was so small that no food seems to have entered the bronchi, while in the remaining case it is certain that food entered the bronchus and caused death by gangrene of the lung.

Relative Infection in Intracranial Tubercle.

Intracranial tubercle was found in 47 of the 100 cases (in 24 no examination of the head was allowed). In 40 of these it was the direct cause of death. In every case some focus of infection was found within the body.

In 25 the tubercle was widely distributed about the body; in nine the lung and thoracic gland only were infected; in three the lymphatic gland only, and in three the liver and spleen only.

One other point is of interest, though not directly bearing on the subject, viz., the age at which death from meningitis most frequently occurs.

Both Rilliet and Barthez and Sims Woodhead show that the majority of cases occur during the year from three to eight, while both Dr. Colman's and my own figures point to an earlier period

of life as being more common. If, however, one takes percentages instead of actual numbers, one finds that below the age of three years 40 per cent. die of meningitis, while above that age 45 per cent. died of meningitis.

Infection of Cervical Glands.

Out of the 100 cases the cervical glands were found to show evidence of tubercular infection in 14 cases—in seven of these the glands were extensively involved.

In four of the above cases there was marked ulceration of the fauces and pharynx, and in two had extended to the epiglottis.

Abdominal Infection.

It was found that in 86 cases out of the 100 there was infection of some abdominal organ or gland, and the following table shows the relative frequency of such infection :—

TABLE IV.

No. of Cases of Abdominal Infection.	Ulceration.		Glandular Infection.	Spleen.	Liver.	Kidney.
	Slight.	Extensive.				
86	22	27	63	63	58	34

In 19 of the 63 cases in which there was infection of the abdominal glands, there was no ulceration of the intestine, and in four there was ulceration of the intestine without infection of the glands.

Of the 63 cases in which the mesenteric glands were infected, 54 showed also infection of the thoracic glands, and of 83 cases in which the thoracic glands were affected the abdominal glands were infected 53 times. In six cases were the mesenteric glands the only glands infected in the body, and in six cases were the thoracic glands the only glands affected.

The above statement has been given in some detail, but it is my wish to compare the figures with some given by Dr. Sims Woodhead from an analysis of his own cases, in which he points out that tubercular infection occurs more frequently through the intestines and abdominal glands than by means of the thoracic organs and glands. In his series of 100 cases of mesenteric tubercle, 31 showed no thoracic tubercle, while in 27 cases out of 127 the thoracic glands only were infected.

In the present series of 63 cases of mesenteric tubercle, nine

showed no thoracic tubercle; while in 83 cases of thoracic tubercle 30 showed no infection of the mesenteric glands. The cases in which the glands only were infected are divided evenly between the thoracic and abdominal cavities.

Endeavouring as far as possible, either by the limitation of infection to one cavity, or by extensive infection of one cavity compared to the other, to determine where the infection first took place, it would seem that in 33 cases the disease originated in the thorax, and in 15 cases in the abdomen.

The above facts seem to me to point undoubtedly to the more frequent infection of the thoracic glands, and the difference exhibited on this point between the statistics of Dr. Sims Woodhead and my own, raises the question of comparability of the two series.

The present series is drawn from a source where there is a larger proportion of younger children, and contains very few above the age of eight; while the statistics of Dr. Sims Woodhead contain a considerable number over that age. Whether there are other circumstances, such as the unhealthy conditions under which many of the children of the London poor live, I am not here prepared to discuss.

I have for the sake of reference prepared the following table, showing the infection of the thoracic and abdominal glands and ulceration of the intestine at the various ages :—

TABLE V.

Age.	No. of Cases.	Thoracic Glands.	Ulceration of Intestine.	Abdominal Glands.
Under 1 year	14	12	8	9
,, 2 years	22	17	14	17
,, 3 ,,	21	18	13	15
,, 4 ,,	14	12	6	8
,, 5 ,,	7	6	1	1
,, 6 ,,	5	4	1	4
,, 7 ,,	5	5	2	2
,, 8 ,,	6	4	2	3
,, 9 ,,	3	3	1	2
,, 10 ,,	2	1	0	1
,, 11 ,,	1	1	1	1
Total . .	100	83	49	63

In the above analysis the evidence is purely macroscopic. Microscopic evidence has been scanty and not systematically carried out. Caseous and calcareous glands have been taken as evidence of tubercular infection, and have not been verified by inoculation experiments.

Summary.

In the above paper it has been my desire to point out the relative liability to infection of the various lymphatic glands in the body, showing that infection most often takes place through the thoracic organs and glands; that the glands on the right side of the thorax are more liable to infection than on the left, and hence morbid conditions of the right lung more frequently arise.

The evidence on which the paper is based is taken from the post-mortem records of the Children's Hospital, Great Ormond Street. Out of 290 post-mortems, 100 cases occurred in which tubercle was found. Seventy-five of these died directly from tubercle, 25 from other causes.

Of the 75, 40 died of intracranial tubercle, 26 of tubercle of the lungs, and 9 of abdominal tubercle.

Seventy-one per cent. of the deaths occurred below the age of four years.

The relative infection of the thoracic glands is dealt with, and it is shown that the gland at the bifurcation of the trachæa is most often affected, and that the glands at the root of the right lung and to the right of the trachæa, are more frequently affected than those on the left.

It is pointed out that the right lung is more frequently affected than the left as a direct consequence to the implication of the glands.

The condition of the cervical glands is noted, and, lastly, the relation of abdominal to thoracic tubercle is discussed, the evidence pointing to the more frequent infection of the thoracic glands.

In conclusion, considering the frequent infection of the thoracic glands as compared to the other glands of the body, one would seem justified in the assumption, that though by careful attention to the origin of infection of the glands in the neck, viz., the ears, teeth, tonsils, and by attention to the ingesta, a certain percentage of the fatal results from tuberculosis might be avoided, yet until one is able to diminish the liability of the thoracic gland to infection by eliminating those conditions and diseases which especially in children give rise to an inflammatory condition of the glands, little will be done to lessen this large mortality from tuberculosis.

MAL DES MONTAGNES; OR, SO-CALLED MOUNTAIN-SICKNESS.

BY

MALCOLM L. HEPBURN, M.D., B.S., F.R.C.S.

Those who have climbed amongst the higher ranges of the mountains find that they are attacked by a complaint—for we cannot call it a disease—whenever they get above a certain height, and to the train of symptoms which they experience the name of "mountain-sickness" has been given. The existence of this "Mal de montagne" was for some time doubted, and the symptoms described by those who experienced the phenomenon were regarded as exaggerations of a condition which would be likely to arise from the effects of such prolonged exercise. Of late years, thanks more especially to the researches of Mr. Whymper in 1879–80, it has been proved conclusively to the minds of most people that mountain-sickness is a real complaint; but there are still some who doubt this, and denounce the efforts of those who try to investigate the cause as so much unnecessary fuss. All I have to say to such people is, "Go and try." It is useless for these individuals to argue, because they can sustain for a few minutes under a bell jar without much inconvenience a diminution of pressure corresponding to a height of 20,000 feet or more above sea-level, that there is no such thing as mountain-sickness. Having said this much, I will leave the rest of my paper to prove that what I say is correct.

Mal de montagne generally manifests itself in its true form at a height of about 16,000 feet, quite independently of the effects produced by fatigue, privations, cold, and insufficiency or unsuitability of food, and cannot therefore be explained by the physiology of ordinary, or even extraordinary exertion. There is also abundant evidence to show that no hard and fast line can be drawn as to the exact height at which the symptoms

make their appearance, hence the use of the expression "about 16,000 feet."

The name "mountain-sickness" is a bad one, since it suggests vomiting as a prominent symptom, when indeed it is rather uncommon than otherwise; but in England it retains its old name, though the French is to be preferred.

Mal de montagne has been described by Father D'Acosta in 1590, who ascribes the cause to "delicacy of the atmosphere;" it is also described by Bougner in 1737, by De Saussure in 1786, by Humboldt in 1802 in the Andes, by Whymper in the Andes, 1879–80, by Conway in the Himalayas, 1892, by Thomas in the Rockies (*Alpine Journal*, May 1894), &c. Let us therefore go to the mountaineers for the description of their symptoms.

Humboldt, speaking of Chimborazo, says: "We were only at an elevation of 17,300 feet, therefore scarcely 200 feet higher than we attained three months previously upon the Antisana. After an hour's cautious climbing the ridge of rock became less steep, but the mist unfortunately remained as thick as ever. One after another we all began to feel indisposed, and experienced a feeling of nausea, accompanied by giddiness, which was far more distressing than the difficulty in breathing. . . . Blood exuded from the lips and gums, and the eyes became bloodshot. There was nothing particularly alarming to us in these symptoms, with which we had grown familiar by experience. Once when upon the Pichincha, though bleeding did not occur, I was seized with such violent pain in the stomach and overpowering giddiness that I sank upon the ground in a state of insensibility, in which condition I was found by my companions, from whom I had withdrawn for the sake of making some experiments in electricity. The elevation then was not so great, being less than 13,800 feet. On the Antisana, however, at a height of 17,022 feet, our young travelling companion, Don Carlos Montufar, had suffered severely from bleeding of the lips. All these phenomena vary greatly in different individuals according to the age, constitution, tenderness of the skin, and previous exertion of muscular power; yet in the same individual they constitute a kind of gauge for the amount of rarefaction of the atmosphere, and for the absolute height that has been attained." The conclusions arrived at in this last paragraph strike me as being rather too indefinite to be of much service.

Mr. Whymper, in his "Travels amongst the Great Andes of the Equator," gives perhaps the best account that has ever been given, and he describes the subject thus: "When we arrived at the second camp (16,664 feet), we ourselves were in good

condition, which was to be expected, as we had ridden most of the way; but in half-an-hour I found myself lying on my back, along with both the Carrels,[1] placed *hors de combat,* and incapable of making the least exertion. . . . We were feverish, had intense headache, and were unable to satisfy our desire for air, except by breathing with open mouths. This naturally parched the throat, and produced a craving for drink which we were unable to satisfy, partly from difficulty in obtaining it, and partly from trouble in swallowing it. When we got enough, we could only sip. . . . Before a mouthful was down we were obliged to breathe and gasp again, until our throats were as dry as ever. Besides having our normal rate of breathing accelerated, we found it impossible to sustain life without every now and then giving spasmodic gulps, just like fishes when taken out of water. . . . We wished to smoke, and found our pipes also refused to burn, for they, like ourselves, wanted more oxygen."

Mr. Whymper's symptoms lasted sixty hours; his two guides, Jean-Antoine Carrel and Louis Carrel, recovered their symptoms somewhat sooner, the former suffering a shorter time than the latter, and one of the party (a native of the place) did not suffer at all at that height.

This phenomenon occurred on December 27th, 1879, and lasted more or less till December 31st, when the more acute symptoms passed off, and Mr. Whymper was left "lifeless and feeble." From December 31st to January 4th, 1880, he spent the time between the second and third camps (*i.e.*, at a height varying from 16,664 feet to 17,285 feet). On January 4th they left the third camp to go on to the summit of the mountain (Chimborazo, 20,608 feet); when at 18,500–19,000 feet, Jean-Antoine showed signs of fatigue. Above 20,000 feet, although the snow was very soft, thus necessitating hard work, they took three hours to ascend 300 feet, a rate of climbing which, even under such circumstances as he describes, suggests some other cause than the softness of the snow. Mr. Whymper says that during this day he had no acute symptoms, only "a feeling of lassitude and want of vivacity." Diminution of pressure during the day was two inches. Louis Carrel was the most fatigued of all. Some days afterwards Mr. Whymper ascended Cotopaxi (19,613 feet), and spent the night near the summit; and he says "that there were no further symptoms, only slight headache and lassitude." He also says, "During the ascent the pace was slow, but it was steadily maintained." At one point, when between 18,000 and 19,000 feet, they went up

[1] Guides.

360 steps without stopping. "I noticed nothing unusual during the ascent nor upon the summit, except the overpowering desire to sit down, which always mastered us when we were at great elevations, and the disposition to breathe through open mouths. . . . Hour after hour went by on the summit of Cotopaxi without anything of the kind[1] happening again. . . . Louis Carrel acknowledged that he had rather a sharp headache, and I had a slight one. That was all beyond the feeling of lassitude, which, I repeat, always came over us at the greatest heights."

They ascended Antisana (19,335 feet) some time afterwards, at a rate of 767 feet per hour from the camp (15,984 feet). On Cayambe (19,186 feet) they ascended at the rate of 831 feet per hour. "Whether fast or slow, I remarked that both the Carrels commenced to give indications of fatigue when we were about 18,000 feet high." On June 29th they made the ascent of Carihuairazo (16,515 feet) at the rate of 660 feet per hour.

On July 3rd they ascended Chimborazo a second time, and Mr. Whymper says, "No headache, but while in movement all found it necessary to breathe through the mouth as well as through the nostrils; when at rest, sufficient air could be obtained through the nostrils alone; and on the summit I was able to keep my mouth shut for ten minutes while observing my temperature." At no time were there such symptoms as hæmorrhage, nausea, or vomiting.

To sum up Mr. Whymper's symptoms, they are at first acute—

1. Accelerated respiration with gulps.
2. Accelerated heart-beat.
3. General malaise and incapacity for exertion.
4. Intense headache.
5. Rise of temperature.

These pass off and leave as chronic symptoms—

Increased respiration and increased heart-beat, general lassitude with muscular weakness. Or, in the words of Mr. Dent in "Mountaineering"—"Lassitude which may amount to utter incapacity for the slightest exertion, headache, difficulty of respiration, feverishness, quickening of heart's action, and great disinclination for food. . . . More permanent of these are lack of muscular energy and difficult respiration."

Sir W. M. Conway, in the Himalayas in 1892, says: "Bruce's temperature and mine were both normal, notwithstanding that we plainly felt, and continued to feel all the time we remained at this camp (15,680 feet), discomfort from the reduced atmos-

[1] Acute symptoms.

pheric pressure. Every man of the party suffered headache. Our pulses beat with more than usual rapidity, and the tracings of them made with the sphygmograph differed from tracings made at lower levels. Zurbriggen found that during his last 1000 feet[1] of ascent he had to travel more slowly than he was accustomed. We all felt a disinclination to do anything that involved change of position, and it required an effort of will to get up and read the barometer and other instruments. We had a tendency to place ourselves in such attitudes as left the chest most free, and I observed that during the latter part of the ascent I walked more easily with my hands resting on my hips than hanging by my sides. Bruce desired to take occasional deep inspirations. My fatigue, and the feeling of weight in the legs, was immediately diminished if, in walking uphill, I breathed more deeply and more rapidly than usual. . . . We never afterwards experienced so much discomfort at so low a level."

Again—

"Here, at an altitude of about 16,000 feet, we found greater difficulty in breathing than at any time in the ascent of the Crystal Peak (19,400 feet). On comparing notes, it appeared that all felt alike. The difficulty in breathing was clearly connected with the stagnation of the air in the enclosed valley and with the heat of the sun."

And again—

"Mere existence at these altitudes (18,000 feet) was already work enough. While it was cold, or snowing, or night, we were comfortable enough as long as we were doing nothing . . . but let a single gleam of sunlight fall upon the tent and everything is changed. A headache probably appears upon the scene. In any case, one pants for breath if one moves; and if one involuntarily catches one's breath in the act of doing something, one instantly becomes dizzy."

On the summit of Pioneer Peak (23,000 feet) he says: "We ceased to pant for breath the moment the need for exertion was withdrawn, and a delicious lassitude and forgetfulness of past labour supervened upon our overwrought frames. All felt weak and ill, like men just lifted from beds of sickness. . . . We had all practically reached the limit of our powers. We might have climbed a thousand feet higher, or even more, if the climbing had been easy, but Zurbriggen said that another step he could not cut."

In another part, at a height of 17,650 feet, he states that no one seemed to suffer, though they had to breathe faster and

[1] Farther on.

deeper. At another place, when 18,000 feet high, he says they suffered little inconvenience so long as they advanced at a steady pace, and did not have to make any sudden movement.

The symptoms, as will be seen, are essentially the same as those described by Mr. Whymper and other observers; on all occasions at high altitudes it required *an effort of will* to perform any work.

Dr. Frankland and Dr. Egli-Sinclair respectively suffered on Mont Blanc; but no doubt in the earlier days the symptoms of fatigue were confused with those of mountain-sickness; and we must, I think, conclude that this may account for some of Humboldt's experiences, which are otherwise difficult to explain.

In addition to the symptoms described above, we may mention those given in Landois and Stirling's Physiology as occurring in people who are subjected to artificial reduction of pressure.

(1.) Redness and swelling of the skin, and free mucous membranes; therefore hæmorrhage from the nose, lungs, gums; turgidity of cutaneous veins, &c.

(2.) A feeling of weight in the limbs, a pressing outwards of the tympanic membrane (until the tension on each side is equalised by the opening of the Eustachian tube), and therefore noises in the ears and difficulty in hearing.

(3.) Frequency of pulse and increased respirations.

(4.) Disturbances of digestion, dulness of senses, and it may be unconsciousness.

Let us next recapitulate, and as far as possible criticise, the various opinions already expressed respecting the causation of these symptoms; and in order to do this most fairly we must first of all enumerate certain fundamental points in physics and physiology upon which we can base our discussion.

Physical.

(1.) The percentage composition of the atmosphere by volume is as follows:—

	Per Cent.
Nitrogen	78.49
Oxygen	20.63
Aqueous vapour	.84
Carbonic acid	.04
Ammonia	very small

(2.) The atmospheric pressure (which normally is 15 lbs. on a square inch at sea-level) gradually diminishes as we ascend.

(3.) The volume of any gas varies inversely as the pressure. That is to say, if the pressure to which a gas is subjected be reduced to one half, that which occupied one volume under the former pressure would occupy twice that volume under the latter; or in other words, one volume of air would contain half the amount of oxygen that it did at the higher pressure.

(4.) The volume of a gas is increased by rise of temperature and decreased by a fall.

(5.) The absorption of any gas by a liquid depends on the partial pressure of that gas in the atmosphere to which the liquid is exposed.

(6.) The temperature of the air at very high altitudes is often very low, and may register as much as 20° C. (or more) below freezing-point.

(7.) Hygrometry.

N.B.—We shall also notice that the variety of mountain (whether rock or snow) and the condition of the air (whether at rest or in motion) will help us somewhat in explaining certain phenomena.

Physiological.

(1.) Expired air contains about 4 or 5 per cent. less oxygen and about 4 per cent. more CO_2 than inspired air.

(2.) When the depth of breathing remains the same, by quickening the *rate* of breathing the percentage of CO_2 in each breath is lowered, but the quantity expired in a given time is increased.

(3.) In 100 vols. of blood there is about 60 vols. of gas, which consists of:—

Arterial blood, 20 vols. of O; 40 vols. of CO_2; 1 to 2 vols. of N.

Venous blood, 8–12 vols. of O; 46 vols. of CO_2; 1 to 2 vols. of N.

(4.) The oxygen in the blood does not follow the ordinary law of absorption of gas by liquid. There is a chemical association of oxygen with the hæmoglobin of the blood. Some of the oxygen follows the ordinary law, but the greater part does not. When a solution of hæmoglobin or when blood is exposed to gradually decreasing oxygen pressures, at first only a little is given off; but when the pressure reaches 60 mm. of Hg (or 300 mm. total atmospheric pressure), a sudden dissociation takes place and a large quantity is given off. Conversely, when blood at this pressure (300 mm.) is exposed to gradually increasing pressure of oxygen, at first there is a

rapid absorption of the gas, afterwards more slowly; that is to say, there is a greater relative absorption of oxygen at the lower pressures.

(5.) The blood in passing through the lungs takes up from 8 to 12 vols. per cent. of oxygen.

(6.) Expired air contains 16 per cent. of oxygen; therefore the air in the pulmonary alveoli must contain less than this, since expired air consists of tidal air mixed by diffusion with stationary air.

(7.) In man, when the oxygen of inspired air is gradually diminished without any other change in its composition, symptoms of dyspnœa do not make their appearance until the oxygen sinks to 10 per cent. (= 300 mm. total atmospheric pressure = 17,000 ft.) in the inspired, and which must therefore be less than 10 per cent. in the pulmonary alveoli.

(8.) The more venous (less arterial) the blood, the greater the activity of the respiratory centre; and this effect is produced by the blood influencing the central nervous mechanism in the medulla.

(9.) Deficiency of oxygen produces ultimately convulsions and asphyxia; and abundance of CO_2 produces ultimately unconsciousness and coma.

(10.) By training, the respiratory centre may be accustomed to bear a scanty supply of oxygen for a much longer time than usual before dyspnœa sets in.

(11.) Roughly stated, inspiration tends to increase, and expiration tends to diminish blood pressure.

(12.) Pressure on structures inside the thorax but outside the lungs is that of the atmosphere minus that necessary to inflate the lungs.

(13.) Respiratory movements affect the amount of the flow of blood into the left auricle, and so discharge from the left ventricle into the aorta in two ways:—

(*a.*) Through widening or narrowing of the pulmonary vessels, they alter the capacity of the vessels to hold blood for the time being.

(*b.*) In consequence of the difference in resistance occasioned by the widening or narrowing, they alter the rate of flow through the pulmonary vessels.

These two factors produce opposite effects. With quickly repeated respiratory movements the first factor comes to the front; when slower, the second factor becomes the more prominent.

(14.) Deficiency of oxygen in the blood produces slowing and weakening of the heart's action through the cardiac muscle

itself, and raises the blood pressure through the vasomotor centre.

(15.) Venous blood has been shown to increase peripheral resistance in the capillaries.

(16.) If the blood stream is slowed through the lungs, the red-blood corpuscles wait in the vessels, and cannot get the oxygen they want, so that the blood is not properly arterialised.

(17.) The free supply of oxygen not only favours the removal of the CO_2 which is loosely combined, but it also favours the expulsion of that portion of the CO_2 which is more firmly combined, and which can only be expelled by the addition of acids to the blood (Landois and Stirling).

(18.) About a quarter the total amount of blood in the body resides in the muscles.

(19.) A muscle contains in itself no free or loosely attached oxygen; when subjected to a vacuum no oxygen is given off, and when placed in an atmosphere free from oxygen it will continue to give off CO_2.

(20.) The oxygen pressure of a muscle being always *nil*, there will always be taking place a passage of oxygen from the blood into the muscle, which then stores it up in some inexplicable way.

(21.) Muscular action increases the activity of the circulation and respiration, probably through the action of some unknown substance generated by muscular contraction, which is not affected by its passage through the lungs; for it has been shown that the blood issuing from the left side of the heart is more arterial than normal during muscular exercise; therefore it cannot be due to the action of deficiency of oxygen or increase of CO_2 in the blood which circulates through the medulla.

(22.) In muscular contraction there is (*a.*) a slight acid reaction, and (*b.*) a considerably increased quantity of CO_2 given off, not accompanied by any increase in consumption of oxygen (three times as much as during rest).

(23.) Muscles are developed up to a certain point with increased amount of work, either by increasing the load or prolonging their action (the load remaining the same).

(24.) After a time muscles get into a condition known as fatigue, the physiology of which has not been satisfactorily explained, but which has been shown to disappear under the influence of a stream of arterial blood, rest, or electrical stimulation.

(25.) The supply of oxygen, though necessary for the maintenance of irritability, is not necessary for the manifestation of that irritability. Venous blood causes irritability to disappear

more rapidly than if there were no blood at all. One additional fact may be mentioned as likely to help us in the discussion of the subject, and that is the varying oxygen capacity of different layers of corpuscles and of different individuals at any one time. This has been the subject of a paper in the *Journal of Physiology*, vol. xvi., by Drs. Haldane and Smith.

Most observers regard the diminished pressure of the atmosphere and the deficiency of oxygen as playing the most important part in the causation of the symptoms experienced by any person who is subjected to reduced atmospheric pressure, whether they be aëronauts, mountaineers, or individuals undergoing artificial experiment; and there is little doubt that this view is up to a certain point correct, and that these two well-known physical facts are the great pegs, as it were, upon which to hang any theory. But how these two phenomena produce their effect upon the body is the point where opinions differ, and, as far as I can discover, it is only just hinted by one or two of the various writers that the symptoms produced by the two may be more or less differentiated, and that aëronauts, mountaineers, and experimenters with artificially reduced pressure, are not to be placed under the same heading; and I hope to bring forward in this paper a few points which seem to me to tend very strongly towards the truth of such a suggestion.

The best known opinions on the subject are the following.

Mr. Whymper gives the explanation of his symptoms thus:—

"In reviewing the whole of our experiences, two different sets of effects could be distinguished, viz., those which were transitory and those which were permanent. The transitory effects were acceleration of the circulation of the blood, increase in the temperature of the body, and pressure on the blood vessels. The permanent ones were augmentation of the rate of breathing, and disturbance of the habitual manner of respiration, indisposition to take food, and lessening of muscular power. The whole of these, doubtless, were due to diminution of pressure; but the transitory ones, presumably, were produced by some cause which was itself temporary. There are strong grounds for believing that they are due to the expansion (under diminution of external pressure) of gaseous matter within the body, which seeks to be liberated, and causes an *internal* pressure that strongly affects the blood-vessels. While equilibrium was being restored between the internal and external pressure, the "indescribable feeling of illness" gradually disappeared and headache died away; and it may be reasonably expected that these acute troubles can be escaped by taking pains to

avoid abrupt diminution of pressure. From the 'permanent' effects there is no escape. The large increase in the rate of respiration, and the compulsory breathing through open mouths, were caused by involuntary efforts to make up for the decrease in the *density* of the air by imbibing a greater *volume*. It was possible, without any great effort, at the pressure of 14.75 (19,000 feet), to sustain life *while at rest* by increasing the volume of air inspired, and thus in some measure to compensate for the reduction in its density (which was then half that of air at the level of the sea). But *when in movement*, it became difficult to enlarge the breathing capacity to the extent necessary to meet the *further* demand for air, which was the result of muscular exertion; and notwithstanding the increased efforts which were put forth to meet this demand, there was, in all probability, a *considerable* deficiency in weight and value of the amount which was imbibed."

Mr. Whymper's opinion, therefore, is that it is mainly due to diminution of atmospheric pressure, though he admits diminution of oxygen per unit volume of air as being a factor.

We criticise Mr. Whymper's theory at two points. It is well known that gases liberated in the way that he mentions can be very rapidly absorbed in the living subject; and if the gases were present in the blood to the extent that he supposes, his symptoms would have been much more severe, and would have assumed the character of asphyxia. Again, how does he explain by his theory the suddenness of his attack (a fact which he himself particularly notices) when the reduction of pressure was so gradual?

Professor Roy has also pointed out that it is a curious fact that no other observer has noticed any rise of temperature such as Mr. Whymper experienced, and he is inclined to regard it as an accident due to some other bodily derangement present at the same time (*e.g.*, digestive); and I confess it is a little difficult to explain otherwise, though my suggestion towards the close of this paper may afford a possible solution of it.

In the *Jahrbuch* of the Swiss Alpine Club for 1891–92 is a paper by Dr. Egli-Sinclair on "Bergkrankheit," and the writer says that the high altitudes render the blood poor in oxygen, and he finds that the quantity of hæmoglobin is considerably diminished, but that after a time it increases, and to this increase, he says, the recovery of mountain-sickness is due. I leave the criticism of Dr. Egli-Sinclair's theory in the hands of Mr. Monro, who shows very clearly in his article on the subject in the *Alpine Journal*, that if it were correct, mountaineers would have alternating attacks of mountain-sickness and

recovery periodically, whereas it has been distinctly proved that recovery is more or less complete.

Dr. Clifford Allbutt ascribes the cause of "Mal de montagne" to dilatation of the heart, and considers this the principal factor; but I cannot agree with this, nor with Mr. Monro, who regards it as one of the factors of a composite cause. No doubt dilatation of the heart does produce symptoms, but such symptoms would occur at sea-level if a person with this condition of heart were to perform sufficiently laborious work, and we must regard this as due to the onset of fatigue consequent upon the dilatation (and so incapacity) of the heart. It is only natural that, with such a tendency to pulmonary obstruction, the symptoms described should manifest themselves, irrespective of the condition of the atmosphere.

Those who regard the symptoms as due to fatigue alone need only to have their attention directed to the fact that people who have actually been able to ride quietly up to 16,500 feet suffer in exactly the same way as those who have *climbed* to that height.

There are others, again, who regard any symptoms occurring on the mountains as constituting mountain-sickness. Such observers are Dr. Spier in the *Association Medical Journal* for 1853, and to a less degree Dr. Tripe in his presidential address to the Medical Officers of Health, 1882; also Dr. Lortet in the *Lyons Medicale* for 1869 on "Deux Ascensions aux Mont Blanc," and Dr. Gardner in the *American Journal of Medical Sciences*, Philadelphia, 1876, &c. Nearly all these writers state that the symptoms show themselves at heights ranging from 8000 feet upwards, and, after tabulating the effects produced, mention the fact that they are not constant and differ in different individuals; but it is characteristic of the true form of mountain-sickness that it occurs in every member of the party at the same height, which height is about 16,500 feet; and again it is difficult to believe that symptoms of Mal de montagne show themselves at a certain height on the mountain-side, and then disappear on the summit, where the atmospheric pressure is often decidedly lower. Both Dr. Lortet and Dr. Tripe make a point of mentioning this variation in constancy of the symptoms. Within the last few months there has been published the results of Sir W. M. Conway's scientific observations in the Himalayas, and amongst other things Professor Roy's explanation of the symptoms experienced by the party at high altitudes. He states that it is impossible to say whether heart failure does or does not produce mountain-sickness; and he gives his opinion thus: "So far as

the symptoms are concerned, we need therefore be in no difficulty regarding the nature of mountain-sickness. It is asphyxia. The important feature in the asphyxia of mountain-sickness is the reduction in the amount of oxygen supplied to the tissues, but the same effect is produced if, with a limited supply of oxygen to the system, there be from any cause an increased demand for it by the tissues." I cannot help thinking that asphyxia is rather a strong term to apply to the effects produced at heights above 16,500 feet, if we look at it in the sense in which it is usually used; and that it would have been better to use the expression "deficiency of oxygen" simply as it stands. Again, too, he places nausea, vomiting, and hæmorrhages amongst the symptoms which I do not think ought to find a place there, for we do not notice any such things mentioned in Whymper's or Conway's descriptions, and the former takes particular care to say they never occurred.

The next opinion we will mention is that put forward by Mr. Dent and Mr. Monro, these two observers expressing practically the same view regarding the cause of the symptoms.

Mr. Clinton Dent, in an article in the *Geographical Journal* for January 1893 on "Physiological Effects on High Altitudes," says: "The effect of diminished pressure on the portion of spinal cord concerned with the nutrition of the lower limbs is a far more important matter. . . . The effect is brought about by an interference with local blood-vessels. Greatly increased pressure produces also much the same symptoms. . . . The circulation of blood is much impeded through the portion of the spinal cord where it is most demanded while the lower limbs are being exerted. The result is that the action of walking, which should be almost automatic at great heights, demands a powerful effort. Hence follows fatigue. Recovery can take place, but only very gradually."

Mr. Monro, in an article in the *Alpine Journal* for August 1893, states it as his opinion that the cause of Mr. Whymper's attack "was produced by a resultant, the factors of which were, first, and perhaps most important, cerebro-spinal anæmia; second, the diminished quantity of oxygen; third, the probably enfeebled condition of the heart; and fourth, as the last straw, the taking of a meal. . . . If we accept the theory of cerebro-spinal anæmia, we can, I think, account for all the symptoms." He also says that these factors may be modified by circumstances. Firstly, climate . . . Secondly, the nature of the ground traversed. Now, in bringing forward his theory, Mr. Monro founds his arguments on the observations of the late Dr. Moxon, described in the Croonian Lectures for 1881 on

"The Influence of the Circulation on the Nervous System." In these lectures it is proved that increased pressure augments the circulation in the spinal cord, and especially in the lower segment of it. The opposite condition is presumed to occur by Mr. Monro in cases where the pressure is reduced, resulting in anæmia of the spinal cord (especially the tip), and so weakness, &c., of the lower limbs. I shall have occasion later on to venture to criticise some of Dr. Moxon's remarks, so that I will only in this place notice one or two points which strike me in connection with this theory.

In the first place, Mr. Monro regards the symptoms of aëronauts, of those placed under artificially reduced or increased pressure, and of mountaineers, as due to a common cause; this, I consider, is a fundamental error in his paper, as I hope to be able to show. Again, I think this is rather a complicated view to take of the effect produced by diminished atmospheric pressure, especially when the evidence is so very scarce upon which such a theory can be based. Dr. Moxon says that post-mortem there are no signs to show that there was either congestion or anæmia of the brain and spinal cord during life; and of course, I presume, there are no cases where a post-mortem examination has been made in any case of true mountain-sickness; and this, no doubt, leads Mr. Monro towards the end of his paper to use these ambiguous expressions: "*if* diminished pressure produce spinal anæmia," &c. &c., and "*if* diminished pressure produce a tendency to cerebral anæmia," &c. &c. In the factors of his resultant, Nos. 3 and 4 are only indirect causes of fatigue, which produces very similar symptoms to those of mountain-sickness. I think also he gives too prominent a position to vomiting as one of the acute symptoms; this, according to the latest observers, is generally absent, only appearing in a few exceptional cases, whereas the other symptoms occur in every member of the party, even the natives.

M. Paul Bert, in his work "La Pression Barométrique," expresses it as his opinion that the symptoms produced under reduction of pressure are due to diminution of oxygen per unit volume; and he did many laboratory and balloon experiments in order to test this point. He shut himself up in a metal cylinder with a bag of oxygen, and gradually exhausted the air, thus subjecting himself to diminished pressure of varying degree. He attained a height corresponding to that of Mont Blanc in about half-an-hour, and before reaching this point experienced nausea and dizziness; he inhaled oxygen and reduced his pulse rate. The whole experiment lasted about 128 minutes.

On another occasion he performed a similar experiment on

MM. Crocé-Spinelli and Sirel, and in thirty-seven minutes they reached a height corresponding to 24,000 feet; they refreshed with oxygen, but their pulses rose to 132. At the lowest pressure they experienced a sort of drunken sensation, and could neither see nor hear clearly.

Later on these last two gentlemen went up to 24,000 feet in a balloon, and experienced the same symptoms, but were somewhat relieved by inhaling oxygen; they, therefore, about a month later, with M. Gaston Tissandier, ascended to a height of 28,000 feet, taking with them oxygen; at this height the two former died, and M. Tissandier had a narrow escape. It appears that a very rapid descent can be made without any harm resulting.

Now it is necessary to examine very closely M. Paul Bert's experiments, for it is in his cases that we are able to suggest a difference between the symptoms of aëronauts, &c., and those of mountaineers, if such a difference exists. Let us commence by noticing a few points, without, for the present, drawing any conclusions from them. In the first place, it is clear that no element of fatigue can be brought into the cases; in the second place, let us notice the time taken in the ascents.

In M. Bert's first experiment he remained sixty-eight minutes at the reduced pressure (about equal to the summit of Mont Blanc), which he reached in thirty-five minutes from sea-level; he suffered from nausea, dizziness, and rapid pulse. In the second and third experiments, those subjected to the diminished pressure (about equal to 24,000 feet) remained only a short time under these conditions, which they arrived at in thirty-seven minutes. In the case of the laboratory experiment, they refreshed with oxygen with no benefit to their pulses, but in the balloon experiment at the same height they were somewhat relieved on inhaling oxygen. In the balloon ascent, which was fatal, they reached a height of 26,000 feet in two hours, and remained about two hours (?) at a height of 28,000 feet.

In another well-known balloon ascent on September 5th, 1861, undertaken by Messrs. Glaisher and Coxwell, they reached a height of 15,750 feet in twenty-eight minutes, and 29,000 feet in twenty-four minutes more, when the temperature was -16° C.; or, to put the matter in a tabular form—

(1.)	Ascent to	height	of about	15,700	feet	in 35 minutes.
(2.)	,,	,,	,,	24,000	,,	37 ,,
(3.)	,,	,,	,,	26,000	,,	2 hours.
(4.)	,,	,,	,,	15·750	,,	28 minutes.
(5.)	,,	,,	,,	29,000	,,	24 minutes more.

In mountaineering, taking the rate of climbing at the fastest, excluding halts, &c., viz., 1000 feet per hour, this would give for the respective times necessary to reach these heights—

(1.) Ascent of about 15,700 feet about 15 hours.
(2.) „ „ 24,000 „ 24 „
(3.) „ „ 26,000 „ 26 „
(4.) „ „ 29,000 „ 29 „

In the third place, let us note the time during which they remained at the various pressures—

(1.) For sixty-eight minutes.
(2.) For two or three minutes.
(3.) For two hours (?) at a height of 28,000 feet.
(4.) For "a short time" at 29,000 feet.

In the fourth place, let us notice the temperature under the various conditions. When experiments were done under metal cylinders, we will conclude the temperature was about normal; when at a height of 29,000 feet, Messrs. Glaisher and Coxwell recorded a temperature of 16° C. (some say lower).

In the fifth place, let us notice the results of inhalation of oxygen, which was supposed to remove the symptoms—

(1.) At height of about 15,700 feet—relieved.
(2.) „ „ 24,000 „ (balloon)—somewhat relieved.
(3.) „ „ 24,000 „ (laboratory)—not much relieved.
(4.) „ „ 28,000 „ (balloon)—death of two, and one nearly died.

M. Bert explained the occurrence of the fatal case by saying that the aëronauts had not sufficient oxygen, but there was still a quantity left when the balloon came down; and he further enforces this explanation by saying that he himself sustained a much lower pressure while inhaling oxygen for one or two minutes; but it seems to me this was too short a time to be able to make any definite statements with regard to the influence of the inhalation.

Having noticed these five points, let us next ask ourselves the question, Why do we not normally feel the pressure of the atmosphere? Clearly because the pressure is equal and opposite in all directions, therefore the pressure must be exercised inside as well as outside the body. The late Dr. Moxon, in his Croonian Lectures, says in one part of his paper, whilst discussing caisson disease, "It needs no experiment to show that great increase of atmospheric pressure must drive

the blood away from the surface of the body, and into parts that are accessible to blood and not to air; *such places are the interior of the cranium and spinal cord.*" Now, if the cranium were an absolutely complete case without any opening whatever, there is no reason why such a state of things should not exist, since the osseous substance of the skull is quite strong enough to withstand the atmospheric pressure; but where we have the interior of the cranium communicating by means of foramina with elastic structures outside—*e.g.*, those of the neck, &c., where every one admits the pressure exerts a certain force, it is a little difficult to believe that in spite of this there is still absence of atmospheric pressure in the cranium and spinal canal. But it is hardly necessary for me to point this out, as Dr. Moxon apparently contradicts himself in another part of the same paper, where he says, "In the process of ageing the brain shrinks, both as a whole, so as to leave space between it and the skull, and interstitially, so as to allow spaces to form around its internal vessels, giving *l'état criblé* on section. The skull is thus not sufficiently filled, and then everything movable and within reach is drawn upon to fill the vacuum. The call tells first upon the cerebro-spinal liquid, whose function it is to supplement the brain in filling the skull, but when the natural amount of this liquid is insufficient, the blood must enter, and be retained to fill the rest of the space." Now we cannot explain all this by making use of the old expression, "Nature abhors a vacuum." At the present day we know that this only means that the atmospheric pressure up to a certain point *does not allow* a vacuum. In the upper part of a barometer tube there is as far as possible a vacuum; therefore the rush of blood, &c., to the cranium must be due to difference of atmospheric pressure, otherwise the arrangement of structures inside the skull ought to remain unaltered in spite of the shrinking of the brain in old age. We may, then, I think, leave the answer to our question as it stands.

This principle is well seen in the case of an ordinary glass bell-jar from which the air has been partially exhausted; if now air be allowed to enter from some other way, the air will rush in until the pressure is equal on both sides of the glass. In the case of an india-rubber bag full of air but not distended, if the air inside be removed, the sides of the bag collapse from the pressure of the external air, because the walls of the bag are not sufficiently resistant, like the glass of the bell-jar, to be able to withstand the outward pressure. Conversely, if the pressure outside were reduced, while that of the inside remained the same, the bag would expand, and if there were an opening,

however small, air would rush out until the pressure was equal and opposite in every direction. Now let us apply these principles to the human body. If the pressure in the air be reduced, the pressure inside the body remaining the same, the tissues, because they are elastic, tend to expand; but since they are not absolutely solid, air will in time diffuse through their substance until the pressure is equalised on the two sides. It is, therefore, only a question of time, and the tendency to expansion ceases. We can also understand that, because the tissues are elastic and more or less solid, the more abrupt the diminution of pressure; and conversely, the slower the change, the more severe on the one hand and the less severe on the other will be the effects produced; and we may say that, if sufficient time be allowed for the pressure to equalise itself, there would be no symptoms at all due to diminution of pressure alone. We may yet go a step further, and say that, if it were possible to diminish the atmospheric pressure to *nil*, and yet in some way to get the necessary supply of oxygen taken in and the carbonic acid removed, then life could go on just as well as when the atmospheric pressure is 15 lbs. on the square inch.

We cannot, of course, say that the converse of all this is true, for, if the pressure be increased gradually up to a very high degree, although this pressure might still be equal and opposite in every direction, there would then be the actual compression of the tissues between these two forces, which they naturally could not sustain. Yet there are certain so-called symptoms described by Landois and Stirling, by Dr. Williams, and others, which occur in persons who are subjected to increased pressure of the atmosphere; but, with perhaps the exception of singing in the ears, which can easily be explained, these symptoms point rather to the fact that the various functions of the body are being carried out more easily, due to the increased amount of oxygen per unit volume. Now, bearing in mind these facts, together with the first four points noticed in M. Paul Bert's experiments, we see that the diminution of pressure is very abrupt compared to the rate of change occurring in mountaineering. When pressure is *suddenly* reduced up to a certain (not very great) limit, various symptoms are produced, which we have described, and I think they can be explained by this tendency to dilatation of the tissues and vessels. The arteries dilate, and more blood circulates through them to fill the vacuum, as it were, that has been formed. This change is naturally felt in those parts which are most superficial and least supported; therefore we get the vessels of the skin and

mucous membranes congested, and because the vessels of the mucous membrane of the nose are not sufficiently well supported to stand the change, we have bleeding at the nose from giving way of these vessels. The cortical cerebral vessels have only slight support, and they would probably feel the change, but, as Dr. Moxon says, no symptoms are produced by congestion of the brain alone, so that we cannot ascribe the headache to this cause, and must look for some vaso-motor explanation to account for this symptom. Moreover, in aëronauts another factor, which we have noticed before, comes into play, and this is cold. When the temperature is -16° C., the vessels of the skin can hardly dilate as they tend to do, since the vaso-motor mechanism asserts itself so that this tendency is overcome, and the blood is sent back into other vessels, amongst which are those of the brain and muscles. These latter, already with a tendency to be over-full, have still more blood sent to them, and we get a feeling of weight in the limbs.

The rapid feeble pulse may be accounted for in two ways, which probably act together, viz.:—(1) The tendency of the heart to be dilated, due to the fact that the pressure on structures inside the thorax but outside the lungs is always less than that in the lungs, which condition under the present circumstances would be much exaggerated; and (2) the vascular condition above described.

The increased respiration rate in aëronauts and those subjected to rapidly reduced pressure under metal cylinders may be due partly to the diminished supply of oxygen; but, in my opinion, mainly to the fact that the diminished pressure outside the lungs causes a tendency to collapse of these organs, which very condition, by acting as a stimulus to the ends of the vagi in the pulmonary alveoli, causes an increase of the inspiratory effort.

The noises in the ear are due to the pressure on one side of the membrana tympani not being the same as on the other, because the air cannot enter as freely through the Eustachian tube as through the external auditory meatus.

When still higher, that is, when aëronauts experience a still greater reduction of pressure, they pass into a state of unconsciousness, and later death. This condition may be due to rupture of the cerebral vessels, or to the accumulation of CO_2 in the blood; but I think that under this very reduced pressure another factor may come into play, which Mr. Whymper mentions as partly explaining his own symptoms, viz., the giving off of a large quantity of gas, and so obstruction to the

circulation. This would cause death in the same way as when air is admitted into the veins of the neck. The paralysis of various parts occurring at this stage may be due to hæmorrhage into parts of the spinal cord, followed subsequently by myelitis.

Dr. Williams, in his recent work, "Aëro-Therapeutics," speaks of "caisson disease," which he describes in the following words:—"Long exposure to this atmosphere,[1] and more especially the change to air at ordinary pressure, gives rise to various symptoms (described by Pol). . . . Severe and excruciating pains, coming on suddenly, commencing in or near both knees, and extending upwards into the trunk, associated with gastric pain and vomiting. The pain principally affects the muscles. In some cases it is followed by paralysis, generally paraplegia of the lower extremities, and paralysis of the bladder and rectum. Cerebral symptoms, such as vertigo and headache, are frequently present. The symptoms appear to be the result of congestion of the brain and spinal cord, resulting in sanguineous effusion and congestion of most of the abdominal viscera. Pulse . . . rapid at first . . . quiets down afterwards. . . . The duration of caisson disease varies from three or four hours to six or eight days. The neuralgic pains do not generally last more than twelve hours, but have extended to five or six days. The paralysis often disappears in twelve hours, but sometimes lasts weeks. Death usually takes place from coma." Post-mortem the changes seen are congestion and softening of the spinal cord and congestion of the brain. Again he says:—"The symptoms of caisson disease never appear in the tube itself, but after leaving it, and depend partly on the time spent in the tube, but chiefly on the rapidity with which pressure is diminished, which never ought to exceed five pounds per minute." Most observers, I find, agree more or less with this description, so that it is hardly necessary to give any other accounts, though the cases described by Dr. Howard von Rensslaer and by Mr. Twyman (Brit. Med. Jour. for 1888) respectively are well worthy of study. When the men are *in* the caissons, they feel more lively and active than at the ordinary pressure of the air, and the respirations are reduced to ten times (or even less) per minute. The late Dr. Moxon and some other writers regard this condition as due to the absorption of a large amount of oxygen.

Now, it must be admitted that the symptoms of caisson disease are very similar to those of aëronauts and people under bell-jars; but these symptoms do not appear until the men come up to the surface, *i.e.*, the ordinary pressure of the atmosphere.

[1] Of the caissons.

It is clear in this case that the diminution of oxygen cannot come into the question, because there is a normal amount present in the atmosphere to which they are subjected when they suffer from the symptoms; and it has been proved by physiological experiment that when blood is exposed to gradually increasing amounts of oxygen it absorbs very little more than under normal conditions; it seems, as it were, just to ignore the extra amount present; so that it cannot be argued that the blood has got used to an extra supply of oxygen, and that when subjected to the ordinary amount it misses the additional quantity, and therefore the symptoms are experienced.

As regards the cause and pathology of caisson disease, with such an admirably worked-out paper before me as that by Dr. Howard von Rensslaer in the "Transactions of the Medical Society of New York" for 1891, I shall not venture to express any further opinion, but will give his conclusions verbatim:—

"From the mass of evidence compared and studied, it seems evident that the pathology of caisson disease is due to *congestion and consequent malnutrition* of all the internal organs, and especially the spinal cord. This congestion is due in part to paralysis of the vessel's walls from previous over-distension, and in part to the lack of vis-à-tergo of the blood current, because the blood finds easier passage through the peripheral vessels, which had been partially emptied by the previous pressure. This comparative stasis of the blood causes a malnutrition of the tissues, which is manifested especially in the organ invariably found congested—the spinal cord.

"*The exciting causes* are: Long-continued pressure; great amount of pressure; rapid removal of pressure; exhaustion and cold during removal of pressure; and probably evolution of gas if the withdrawal of the pressure is very sudden, *i.e.*, ½–1 minute.

"*The predisposing causes* are: Obesity, old age, alcoholic excesses, heat and kidney diseases, lowered vitality of the body from any cause.

"*The pathological lesion of the cord* in most cases of paraplegia is a disseminated myelitis, involving the nerve fibres, neuralgia, and blood-vessels of the white matter, especially of the posterior and adjacent parts of the lateral columns, and producing ascending degenerations of the columns of Goll and the direct cerebellar tract, and descending degeneration of the crossed pyramidal tract, and leaving the grey matter unharmed; having its seat in the dorsal region of the cord, because the portion is physiologically and anatomically the least resistant part of the nervous system, and attacking principally the postero-lateral

columns on account of some anatomical arrangement of the smaller blood-vessels, not thoroughly understood."

When animals died under very great increase of pressure, M. Paul Bert explained the cause by saying that they were poisoned by oxygen; but it is significant how experimenters seem to ignore the actual mechanical pressure on the tissues, which *must* produce its effect after a time. Inhalation of oxygen did not entirely remove the symptoms caused by diminished pressure, though they were improved; and I think this may be explained by the fact that it did so by simply removing the tendency to collapse of the lung, which we have seen mostly causes the increased respiratory movements, and that probably any harmless gas would have answered the same purpose for the short time during which the experimenters were exposed to the pressure. Of course, if they had attempted to sustain the pressure for a longer time, no doubt the diminution of oxygen would have played an important part. I think that all these facts taken together go to prove that the symptoms of aëronauts and of people sitting under bell-jars are due to a different cause to that which gives rise to mountain-sickness, and that that cause is diminished pressure of the atmosphere. Therefore we may say at once that the experiments of aëronauts, and of those placed in metal cylinders from which the air is gradually (but more or less abruptly) exhausted, are useless as regards discovering the cause of mountain-sickness.

The one redeeming feature about laboratory and aëronaut experiments is the elimination of fatigue.

On thinking over the subject carefully, it seems to me that M. Paul Bert's opinion is the correct one in the case of mountaineers, though I have endeavoured to show that the experiments performed by him were not those most likely to prove his point; and I shall now attempt, in as concise a manner as possible, to point out that all the symptoms of mountain-sickness may be explained by the diminished quantity of oxygen per unit volume, and I shall proceed to base my arguments in support of this theory on the more or less settled facts mentioned in an earlier part of the paper.

I have more than once hinted that the symptoms produced by fatigue and insufficiency or unsuitability of food are similar to those of mountain-sickness. Dr. Pavy, in a most interesting paper in the *Lancet* (1876), on "The Effect of Prolonged Muscular Exercise on the System," describes experiments performed on Perkins and Weston, and in the case of Perkins, having walked $65\frac{1}{2}$ miles at the rate of $4\frac{1}{2}$ miles an hour, he suffered from exhaustion, which showed itself in the following

symptoms:—A tired feeling of the limbs, vomiting, rapid, feeble, and irregular pulse, slight rise of temperature, and general malaise. These very much resemble those of what we called the acute form of mountain-sickness; therefore, in order to be quite sure that we have only the symptoms of true mountain-sickness to deal with, we must eliminate any condition which gives rise to such effects as these on the body. Want of food is only an indirect cause of fatigue, also brought out clearly in Dr. Pavy's paper, and to this end he saw that Weston should have suitable food regularly.

A prominent symptom of fatigue is vomiting; now this has been shown to be just the reverse in true mountain-sickness, and I think we are justified in saying that where this symptom is the prominent one, the sufferer is afflicted with fatigue, and not with Mal de montagne. It is within the experience of most mountaineers that they suffer from these symptoms more particularly when they have not been careful about training, and have started the season with some major expedition, which is evidently too much to begin with; and under these circumstances it is noticed that the condition shows itself at a much lower level than would be expected if it were due to the true Mal de montagne, for I hardly think that any variations in atmospheric changes, &c., could account for the development of the symptoms at, say, 13,000 feet, when one would not look for them till 16,000 feet at least.

It is interesting, in connection with this part of the subject, to read the earlier accounts of the complaint; for a great many writers describe the most elaborate symptoms referable to the influence of high altitudes. Dr. Speer, in the *Association Medical Journal*, London, for 1853, "On the Nature and Causes of the Physiological Phenomena comprised in the term Mountain-Sickness, more especially as experienced among the Higher Alps," gives a curiously mixed set of symptoms, tabulating them in a most careful manner. At the end of the table he says, "It must not be supposed that all these symptoms are to be met with in every individual upon his attaining a considerable elevation; but, in one instance or another, they have each and all been noticed in ascending the Mont Blanc." He describes mountain-sickness as occurring at various heights, ranging from 9000–15,000 feet, and refers the symptoms to three causes, viz., "a gradually increasing congestion of the deeper portions of the circulatory apparatus, increased venosity of the blood, and loss of equilibrium between the pressure of the external air and that of the gases existing within the intestines." On glancing down his table of symptoms, it is

evident on the most superficial examination that a great many of the effects said to be produced by the rarity of the atmosphere can be accounted for easily by the result of a hard climb, fatigue, or indigestion, especially when the other parts of the paper are carefully followed. Other accounts are given by Dr. Gardner in the *American Journal of Medical Science* for 1876, by Dr. Reed in the *New York Medical Journal* for 1884, by Mr. C. R. Francis in the *Medical Times and Gazette*, London, for 1892, &c.; but, although not so full as Dr. Speer's, they all tend towards the same general mixing up of the symptoms noticed on the mountain-side. Now it is characteristic of the true form of mountain-sickness, as described by the most recent observers, that it attacks *every* member of the party in a greater or less degree in the same way at exactly the same height (or within a few feet of each other), and that height has been found to be about 16,000 feet; and it is certainly a curious fact, that although the number of climbers has considerably increased during the last twenty years or more, no such symptoms as those given in the earlier accounts are ever experienced now except as an isolated case here and there, and in these cases an explanation is generally forthcoming, such as fatigue, unsuitability or insufficiency of food, or an impaired condition of some organ in the body; and Bougner, in his description, admits that fatigue could quite easily account for his symptoms. I have myself suffered once in this way at a height of about 13,000 feet, and the reason was quite obvious.

In order to eliminate fatigue, it is important to be in training, and this is effected by walking, gradually increasing distances per day, and always regulating the pace of climbing so as to keep well within the bounds of comfortable respiration. It is also important, as shown by Dr. Pavy, that small quantities of food should be taken at regular intervals.

It is clear, then, that, with care and attention, fatigue may be put out of the question in a healthy person by observing the two rules about training and food, though, in Mr. Whymper's case, riding up to the camping-place answered the same purpose. In spite of all this, we still have left certain symptoms which have already been mentioned, but which we will just enumerate again, and see if, on analysis, the reduction in the supply of oxygen per unit volume will account for them.

Acute:—

1. Increased respiration, with spasmodic gulps.
2. Incapability for exertion.
3. Intense headache.
4. Slight rise of temperature.

Chronic:—

1. Feeling of lassitude and fatigue.
2. Increased respiration on the slightest exertion.

There is one fact which strikes us in the physiology of the respiratory changes in the blood, and that is that the oxygen is kept in the blood partly by solution, and partly by loose combination with hæmoglobin, and that when the pressure of the atmosphere stands at 300 m.m., oxygen is suddenly given off in great abundance from the blood. Now 300 m.m. corresponds to a height of 17,000 ft. (about), but the symptoms generally come on at about 16,000 ft.; this can be accounted for by the fact that the partial pressure of the oxygen in the pulmonary alveoli is less than that in the air, and since the blood gives up its oxygen while exposed to *air* which contains 10 per cent. of oxygen (that is, 300 m.m. pressure), therefore the change in the pulmonary blood would occur before the oxygen in the air reached 10 per cent., which would correspond to a slightly lower level. When mountaineers therefore reach this pressure the blood in the pulmonary vessels suddenly gives off its oxygen in great abundance. This will account for the suddenness of the attack which was so characteristic in Mr. Whymper's case; and in studying Sir M. Conway's symptoms, it will be noticed that he also suffered more acutely at about this height. The blood then deficient in oxygen circulates through the centre, and immediately gives rise to increased activity of the respiratory movements, more especially of an inspiratory nature. The thorax therefore enlarges by means of its extra muscles of respiration and takes in complimental air in addition to tidal air. I hardly think that the supplemental air is of much use on the mountain-side, as it necessitates a forced expiration before it can be of service, an action which in itself requires extra effort and time not balanced by the amount of air thus obtained. We must not lose sight of the fact that this very giving off of oxygen places the blood in a position of relatively greater power of absorption, if only that gas be supplied to it; this is attempted as far as possible by the increased rate and depth of breathing.

If the above explanation be correct, we should expect this increased respiration to continue until the sufferer gained a lower level. Why then do the symptoms subside? It has been shown that hæmoglobin can accustom itself to combine with a smaller quantity of oxygen than usual, and that by training this smaller quantity will suffice for the needs of the tissues *when at rest*, so that after the first surprise, so to speak, is over, the blood settles down to its diminished supply of

oxygen. When, however, the muscles are brought into action by walking (and also by the increased respiration), they discharge more CO_2 into the blood and give rise to another substance (unknown), which by their combined action on the centre increase the respiratory movements. Thus we see that the activity of the respiration may be increased in at least three ways, which may act separately or together, viz. :—

(1.) Deficiency of oxygen.

(2.) Muscular action by { (*a*) some unknown substance; (*b*) excess of CO_2 in the blood.

The incapacity for exertion is due to the fact that at first the respiratory movements are mainly engaged in dealing with the sudden evolution of oxygen which has occurred without any extra work that would tend to increase them still further. Later on the feeling of lassitude is felt always when above 16,000 feet. Now the muscles of the body do not need oxygen for their contraction, so that the diminished supply of oxygen would not interfere with the manifestation of muscular energy; but unless a proper supply of oxygen be sent to the muscles, they cannot maintain their irritability, therefore when called upon to do any work they soon become fatigued, though they can still get their supply of oxygen during rest necessary for absorption. The physiology of fatigue is not very clear, but we know that fatigue is removed by a good stream of arterial blood and by rest, and this in itself rather suggests that there may be two different physiological reasons of this condition. Now, if the mountaineer is climbing, it is evident that the latter remedy is out of the question; and if the supply of oxygen be diminished, how can the former be carried out, except by still further increasing the respiratory movements, which already have got to their furthest limits?

Again, this deficiency of oxygen which the body has to get used to will be felt mostly by those parts which need it least; the heart and the brain want as much as the blood can afford under the circumstances, and so the effect falls largely on the muscles. This does not matter during rest, as they are then in the same position as the other tissues, but when they perform work they demand more oxygen for the *maintenance* of their irritability which cannot be supplied to them; therefore we get lassitude and fatigue. This is felt more in the lower limbs than elsewhere, because they have to do more work.

The cause of the headache can be explained by almost any theory. Those who uphold the theory of cerebro-spinal anæmia will be able to account for it by anæmia of the brain, but it may equally well be caused by congestion combined with rise of

blood pressure. As we have seen, the cold generally present at high elevations, acting on the vasomotor mechanism of the surface, tends to keep the blood in the other vessels of the body, and amongst other places the brain. In addition, a diminished supply of oxygen in the blood acts on the vasomotor centre in the medulla, and raises the blood pressure. It seems to me that these two conditions are sufficient to account for the intense headache felt in the acute stage. The recovery of this symptom is due probably to the vasomotor mechanism recovering its equilibrium, which it does even after the medulla has been mechanically severed from the spinal centres. The rise of temperature (if it occurs) is perhaps more difficult to explain; but I think we must regard the sudden diminution of oxygen in the blood circulating through the centres in the brain as acting on the heat-regulating centre in the pons (?), and so causing a slight rise of temperature. Now, having entered into the cause of the symptoms, let us see how the height at which they show themselves may vary according to the modifications either in the external conditions or in the body itself.

These modifications are:—

(1.) *Temperature.*—As we have seen, the volume of any gas increases with a rise of temperature, and diminishes with a fall. Therefore if, for any reason, the temperature of the air on one mountain is not the same as on another at the same level the symptoms will appear at a higher or lower level respectively, because in one case there will be less oxygen per unit volume than in the other. On referring to Sir W. Martin Conway's experiences it will be noticed that at certain heights he suffered no symptoms so long as the air was cool, but when the temperature rose, although he remained at the same height, they immediately made their appearance.

(2.) *Condition of the Air in Motion or at Rest.*—Conway noticed that he was much worse in places where the air was stagnant than where there was a fair breeze; and this probably partly explains the symptoms of those who suffered on the Grand Plateau, although perfectly well when they reached the summit of Mont Blanc.

(3.) *The Shape and Condition of the Mountain.*—The shape may affect the symptoms perhaps, more especially by the direction in which its steepest slopes are pointing, and therefore which side of the mountain is the coolest. In this way the temperature and moisture of the air are affected, the result depending upon which side of the mountain the climber is scaling. Thus the symptoms may appear at a varying level. The condition of the mountain, whether rock or snow, would

also have an effect; for if the mountain be all snow, the air will certainly be cooler than at a corresponding height on a rock mountain. We should therefore expect the symptoms to appear at a lower level on rock than on snow mountains, which seems to be the case according to the description of Thomas in the Rockies, where he experienced mountain-sickness several thousand feet lower than usual, and where, I understand, the amount of snow is comparatively small.

(4.) *Hygrometry.*—Although opinions differ as to the relative dryness of the atmosphere at high altitudes, yet variations in the percentage of watery vapour in the air is known to depend on the temperature, winds, position, and shape of the mountains. Any modification in this element will affect respiration in regard to its comfortable performance or otherwise, and may therefore be a cause (perhaps only a slight one) of the symptoms appearing at varying levels.

(5.) *Conditions of the Blood.*—As we have seen, the number of red-blood corpuscles and varying oxygen capacities of those existing differ in different individuals; and consequently the amount of oxygen absorbed by any one person is variable, and the height at which the symptoms make their appearance would therefore vary too.

In conclusion, then, I think we may say that the evidence goes to show that:—

1. The symptoms of ordinary healthy mountaineers above a certain height, *i.e.*, so-called mountain-sickness, and the symptoms of aëronauts and those subjected to artificially reduced pressure in metal cylinders are not due to one and the same cause.

2. The symptoms of aëronauts can be explained mainly by diminution of the atmospheric pressure, combined to a slight extent with the diminution of oxygen per unit volume.

3. The symptoms of Mal de montagne can all be explained by the diminution of oxygen per unit volume.

4. Mal de montagne or true mountain-sickness cannot be recognised as existing below about 16,500 feet.

It would hardly be right to close this paper without calling attention to one or two facts which at first sight are difficult to explain by the theories that have just been mentioned. Mr. Whymper mentions the fact that he was unable to smoke at 16,000 feet because his pipe wanted oxygen; but Sir W. M. Conway's guide smoked a cigar quite comfortably on the top of Pioneer Peak, which is over 23,000 feet high. I think we must look for some other cause for this apparent discrepancy than diminution of oxygen, as, for example, the dampness of the tobacco in Mr. Whymper's case.

Another point is that one of Mr. Whymper's party did not suffer at the height the others were first affected. It is true that he was a native, and had been accustomed to living at high altitudes, and perhaps on this account his thorax was of greater capacity than the others, which change has been shown to occur as a permanency in people who *live* for any length of time at altitudes of about 6000 feet (Weber, Williams); but even then he ought to have had his normal rate of breathing accelerated, although he might have escaped the acute symptoms. As far as treatment of mountain-sickness is concerned, the only methods by which it can be combated are:—

(1.) By climbing at as slow a rate as possible, with frequent halts, and taking a good many days to complete the ascent. This, of course, will necessitate camping-out on the mountain for some time.

(2.) By taking up a supply of oxygen. This would be, of course, a most inconvenient addition to one's burdens, and it cannot be undertaken without much more careful thought and consideration than this bare statement admits of.

I believe that if these two rules be followed, and are found practicable, mountain-sickness will not prevent the highest point on the earth's surface from being ascended by man.

N.B.—It is perhaps noteworthy, in connection with this subject, that Mr. C. Diener, in the Himalayas, suffered from Mal de montagne, with symptoms exactly similar to those of Mr. Whymper, but that he experienced them more at 17,000 feet than above or below this level.

A CASE OF XERODERMIA PIGMENTOSA

(KAPOSI'S DISEASE).

BY

LLEWELLYN C. P. PHILLIPS, M.B.

The patient who is the subject of this disease is a little girl, aged 8, a native of Norfolk.

She was admitted to President Ward on the 4th of October 1895, under the care of Mr. Willett (who has kindly permitted me to report the case).

She was two years old when the affection commenced; it appeared soon after she was vaccinated. It started on the face as small brown spots; then a rash appeared, which increased year by year (its nature is uncertain). It then gradually spread from the face to the neck; later, the forearms and legs became affected.

At first it made slow progress, but latterly has increased more rapidly. The affection throughout has been painless.

She is the youngest of three—all girls—the other two being 14 and 11 years old respectively; neither sister is similarly affected. Her family is an extremely healthy one, there having been no death on either side for some years; both her grandmothers died of consumption. Her father and mother are first cousins. There is no history of lupus, nor other manifestations of tubercle (with the exception just noted) in the family.

She is rather a small child for her age, with light brown hair, well nourished, and, apart from this disease, in other respects healthy.

Her face and neck, upper and lower extremities, are the seat of the malady.

The face and neck are thickly mottled with yellowish-brown and brownish-black pigment spots, which vary in size from a pin's head to a lentil, the larger ones being darker; others are almost black, and slightly raised; the greater number of the pigment spots are not, however, raised. They extend on to

the neck and between the shoulders, the sides and back of the neck being especially thickly covered; they gradually diminish in number as the trunk is reached.

In addition to this, there is on the face a faint pink macular rash between the pigment spots.

Over the right mastoid process there is a small cutaneous nævus, and over the face and neck several more minute telangiectases the size of a pin's head.

To the outside of the right orbit is a depressed scar-like patch the size of a threepenny-bit. Beneath both lower eyelids there are some white atrophic patches about 1½ in. long, the skin there being remarkably thin. These cause a slight amount of ectropion, with a consequent muco-purulent conjunctivitis. On the upper lip there are also some atrophic patches, and others round the alæ of the nose, giving it a somewhat contracted appearance.

On the face there are also some crusts, and small wart-like growths on one or two scars, as the right lower eyelid and septum of the nose. (The growth on the lower eyelid increased in size, and on removal proved to be a cyst with a papillomatous growth inside it.)

On the upper extremities the rash is almost limited to the extensor aspect of the forearm and the dorsum of the hand; it, however, encroaches slightly on to the flexor aspect, and extends a little above the elbow. Its characters are the same as the pigmented rash on the face and neck. There are also one or two raised black patches resembling in all respects small moles.

On the radial aspect of the right forearm there is a small nævus, and in the palm of the left hand there are a few minute stigmata.

A few white atrophic patches of small size are present on the dorsum of the hands.

On the outer side of the legs, and extending slightly in front, close to the knee, there is a similar pigmented rash, only less marked.

The trunk is unaffected save at the root of the neck.

The affected skin is dry and very slightly thickened, but at the atrophic areas it is remarkably thin.

Sensation is quite normal.

She has slight ectropion and muco-purulent conjunctivitis; her irides are pale blue, but have a brown ring immediately round the pupil.

Her mental condition is good, but she has been unable to attend school properly on account of her eyes.

Lungs.—Natural.
Heart.—Systolic murmur right base; otherwise natural.
Urine.—Natural.

The malady was described by Kaposi about twenty-five years ago; it is one of remarkable rarity, only some 40–50 cases being hitherto recorded.

It has been described and known under many names—

Xerodermia pigmentosa.
Xerodermia maligna.
Atrophodermia pigmentosa.
Lentigo lupus.
Lentigo maligna.
Kaposi's disease.

The following short description, taken from Kaposi's account of the affection in Hebra's "Diseases of the Skin" (Sydenham Society, vol. iii. pp. 252 *et seq.*), will suffice to show how accurately this case fits in with it:—

He mentions four cases, all in young girls. He states that it always occurs at a very early age, if it be not actually congenital.

Its distribution is on the face, arms, and legs, just those parts exposed in early childhood.

It consists of pigmented spots, which sometimes begin like the macular rash of measles. Later, telangiectases the size of pins' heads make their appearance; and, later still, atrophic patches, which on the lower eyelids may lead to ectropion. The skin is dry and not thickened, and the epidermis becomes wrinkled. The papillary layer of the skin is affected.

In the last stage the disease becomes more formidable; epitheliomata developing in many places, carry off the patient at quite an early age, generally before puberty.

Thus we see that, with the exception of the development of epitheliomata, this case exactly answers to Kaposi's description of the affection.

THE CASES OF SYPHILIS TREATED IN CHARITY WARD FROM 1893 TO 1895.

BY

CHARLES BARRETT LOCKWOOD.

Introduction.

The venereal wards were opened again in 1893. Mr. Butlin, remembering the interest I take in syphilis, kindly placed the cases under my charge. These wards have now ceased to exist. Whilst they were open much suffering was relieved, and many interesting cases came under our eyes. I propose to give a brief account of these, and of the work which was done.

The female patients who came under my care are difficult to study and teach from. But, fortunately, syphilis is such an objective disease that we succeeded better than some would expect, and without outraging the feelings of the patients.

It is convenient to arrange the cases in groups, and speak of them according to the stage of syphilis which they exemplify. For obvious reasons nothing can be said about the first stage of syphilis, namely, that of incubation. But the periods of local eruption, general eruption, and of gumma were well illustrated, and will be taken in turn. Also some cases of congenital syphilis call for a passing notice.

The expressions primary, secondary, and tertiary syphilis ignore the period of incubation, and are therefore irrational. Thus we have invariably used the nomenclature advocated by Lancereaux.

The notes go back to September 1893, when the ward was reopened. They describe the diseases of 157 patients. The numbers are small because the ward had to be closed on account of the alteration in the south and west wings, and for the building of the new theatre.

Of these 157 patients, no less than 116 suffered from acquired

syphilis, and eight had congenital syphilis. Of the remainder, five were doubtful cases of syphilis, and the rest had gonorrhœa, suppurating glands, labial abscesses, anomalous ulcers, and one had gonorrheal rheumatism. I do not, however, intend to say much about the cases which were not syphilitic.

Gonorrheal rheumatism is rare in women. The case was that of a woman with an ordinary attack of gonorrhœa. It was impossible to fix the time which had intervened betwixt the beginning of the gonorrhœa and the onset of the rheumatism.

Some of the cases of papilloma of the vulva were of the most extensive kind. One patient was quite eight months pregnant, so the question arose whether to operate or wait until after the parturition. We decided to wait, because we thought a huge raw surface, such as an operation would have left, would have been a more serious complication than the papillomata, and ultimately she gave birth without accident or trouble to a still-born child. We had feared sepsis from the papillomatous mass, but none occurred. After the labour the papillomata rapidly shrunk. Doubtless they had been vastly increased by the great turgidity of the pudenda.

A child was admitted with an ulcer near the margin of the anus. She was supposed to have acquired it from her mother, who had a syphilitic ulcer of the cheek. But as the mother's ulcer was gummatous, that assumption could not be allowed. The infant might, on the other hand, have been infected with pyogenic bacteria from the open sore of its mother. After a short stay in the Hospital this child developed endocarditis with albuminuria. At this time Mr. Furnivall found streptococci in the urine, thus explaining the cause of the endocarditis and nephritis.

Twenty-eight of the cases of acquired syphilis were in the stage of gummata, and one had late rupia. In these we do not know where the local eruption (or chancre) was situated. In several cases the sore was absent, probably because of infection through the fœtus. In not a few of the patients with general syphilitic eruption it seemed certain that there had been a sore upon the genital organs, but that the growth of condylomata or of ordinary papillomata had obscured it.

As a rule, syphilis has not been imputed to any case until the general eruption had been seen. In my experience it does no harm to wait for the eruption. Indeed, I should say that those who have a copious eruption of roseola and papules ultimately do the best. Perhaps this is because, having been alarmed by the eruption, they carry out a more regular and prolonged course of treatment, and take more care of themselves. Now

and then, however, the chancre and the neighbouring lymphatic glands were so typical that no mistake was possible, and therefore we did not wait for a rash to appear.

The Local Eruption—Chancres of the Lips and Face, &c.

The local eruption of syphilis or chancre was met with at least six times upon parts of the body other than the organs of generation. Thrice the locality was the lower lip, once the upper lip, once the buttock, and once the eyelids. The details of these cases are briefly as follows.

A woman, aged 19, had the local eruption upon the lower lip near the left angle of the mouth. It was accompanied with a bubo beneath the jaw, and followed by papules and roseola, and superficial ulceration of the throat. The attack seemed of ordinary severity. The origin of the sore was unknown.

A girl, aged 15, was also admitted with a chancre upon the right side of the lower lip near the angle of the mouth. It was accompanied by the usual glandular enlargement, a papular and roseolous eruption, alopeceia, and angina. Nine months before the appearance of the sore she partially lost the use of her right arm from what was said to have been an attack of infantile paralysis.

When chancres occur about the mouth, the lower lip seems to be their favourite seat. A week before the last patient left the ward, another was admitted with a similar sore upon the lower lip, but at the opposite side. It was accompanied with local and general lymphatic engorgement and a roseola over the trunk and limbs. The origin of the sore was unknown.

At present I have a gentleman under my care who also has a chancre upon the lower lip.

Once the chancre was upon the inner surface of the right half of the upper lip. The patient was a young woman aged 20. The sore was accompanied with local and general enlargement of the lymphatic glands, a papular and roseolous syphilide of limbs and trunk, and inflammation and superficial ulceration of the throat and tonsils.

A female child, aged 3, was admitted on October 15, 1894, with chancres upon the upper and lower eyelids near the outer canthus. This child fell in the street and grazed the eye. Her father sucked the wound. On January 7 the wound had almost healed, but a small "pimple" had appeared in one part of it. These chancres were accompanied by general lymphatic engorgement, ulceration of the tongue, anæmia, and roseola. The

father was treated at St. Bartholomew's Hospital in July 1894 for a general syphilitic eruption and condylomata ani.

A school-girl, aged 5 years, had an indurated ulcer upon the right buttock. The local and general lymphatic glands were engorged, the throat ulcerated, with a papular and roseolous eruption upon trunk and limbs. This child lived with a woman who is said to have been in the midst of an attack of syphilis.

Perhaps the following ought to be included in this class:—

Amongst the cases of multiple sore was one in which two chancres appeared upon the cutaneous surface of the inner side of the thigh, but close to the labia. These were attributed to a blow from a lamp which had been thrown at the patient. The sores were followed by roseola on the chest.

A boy, aged 3 years, was admitted with acquired syphilis, but the origin of it was not discovered. He had anæmia, general lymphatic engorgement, ulceration of the tongue, ulceration of the tonsils and fauces, and condylomata of the lip. The glands beneath the angle of the jaw were much enlarged. Perhaps the chancre may have been upon the tongue.

As might be expected, we have met with no exception to the law that venereal sores upon cutaneous surfaces are syphilitic. Also no discrete sore has been seen upon the vaginal mucous membrane, although sores near the nymphæ and fourchette have been seen to encroach upon the vagina for a short distance; in one case for a quarter of an inch.

An Apparent Exception to Colles' Law.

A case was admitted because it was supposed to have been an exception to Colles' well-known law. At first glance the appearances were certainly very deceptive. A woman, aged 35, gave birth to an infant which died of congenital syphilis when seven weeks old (*vide* p. 236). This baby was born on December 20, 1894, and at first seemed quite healthy. In a fortnight it developed snuffles and a rash. About the same time a sore appeared upon the right nipple of the mother's breast. This sore was dry and indurated, and the axillary glands were enlarged. The sore looked exactly like a chancre, which it was taken to be by Dr. Lewis Jones, who sent her in. This idea seemed to be confirmed by the condition of the axillary glands. The sore was followed by a universal papular eruption, general lymphatic engorgement, and angina. Being exceedingly sceptical about exceptions to Colles' law, a further examination was made, and the scar of a chancre was found

upon the cutaneous surface of the left labium major, with enlargement and induration of the inguinal glands.

The explanation of the supposed chancre of the nipple is quite simple. Indurated fissures and ulcers are by no means rare about the nipple, especially when a diseased infant is being suckled. The axillary lymphatic glands, too, are always enlarged during the evolution of the breast. As Crighton has shown in animals, and as I have observed in human beings, this enlargement is mainly due to the presence of numbers of colostrum cells in the lymph paths of the glands.

Chancres upon the Organs of Generation and Perinæum.

The local eruption or chancre was seen in forty-eight cases upon the organs of generation.

37 had one sore; 6 had two sores; 3 had three sores; 1 had four sores; 1 had twenty sores.

The position of the single sores was as follows:—

Labium major	12
Fourchette	9
Nymphæ, right or left	5
Meatus urinarius	2
Anterior commissure	2
Vestibule	1
Prepuce of clitoris	1
Cervix uteri	1
Perinæum	1
Vulvæ (exact site not stated)	3
	37

This distribution accords fairly well with the list given by M. Carrier.[1]

The multiple sores were distributed as follows. In the six cases with two sores they were situated in four upon the labia majora, in one upon the labium major and at the fourchette; and in one the note merely says that there were two sores upon the vulva.

In the cases with three chancres their distribution was as follows:—

[1] Bumpstead and Taylor: "The Pathology and Treatment of Venereal Diseases," 1879, p. 445.

A patient aged 18 had three distinct sores. One was upon the perinæum, the others upon each of the nymphæ. They were accompanied by anæmia, alopeceia, roseola, angina, and general lymphatic engorgement.

A patient aged 28, with three indurated sores, had one upon the inner surface of the right labium major, one opposite it upon the right labium minor, and one upon the left labium minor. They were accompanied with lymphatic engorgement, angina, cephalalgia, anæmia, roseola, and condylomata.

A large sore upon the right labium minor, a second at the fourchette, and a third upon the left labium major, were accompanied by anæmia, cephalalgia, slight roseola, and the usual enlargement of the lymphatic glands.

A woman aged 23 had four chancres. One was at the anterior commissure, one a little in front of this, one upon the right labium major, and one near the margin of the anus. They were accompanied with enlargement of the inguinal glands, general lymphatic engorgement, and a papular and roseolous eruption.

In a woman aged 19 the local eruption was at first a series of pustules scattered over the labia majora and upper and inner sides of the thigh. When these pustules burst they left twenty small indurated ulcers with circular and sharply-cut margins. They were followed by local and general lymphatic engorgement and roseola.

A school-girl, aged 12, was the youngest admitted with acquired syphilis on the organs of generation. She had an indurated sore upon the mucous surface of the labium major, and a second upon the perinæum at its junction with the nates. This was accompanied with local and general enlargement of the lymphatic glands, a papular and roseolous eruption on trunk and limbs, inflammation and superficial ulceration of the fauces, and severe cephalalgia. The administration of mercury by the mouth caused diarrhœa, but she rapidly improved when treated with calomel vapour baths.

The local eruption was once found upon the cervix uteri.

A woman aged 18 years came for a papular and roseolous eruption upon the face and trunk, with rupia upon the legs, accompanied by lymphatic engorgement, ulceration of the mucous membrane of the mouth, anæmia, and cephalgia. The chancre was found upon the posterior lip of the cervix uteri, and partially within the os. It looked, as usual, like a crescentic ulcer. A drawing of it was made for the Museum. It healed rapidly under mercurial treatment.

The other syphilitic lesions ran a severe and rather unusual

course in this case. The head became covered with an eruption, the exact counterpart of an acute eczema. At the same time the cephalalgia became very intense. Rupial patches also appeared upon the arms. Various remedies were given without avail. At last subcutaneous injections of perchloride of mercury brought about a rapid improvement.

Parchment sores were occasionally seen. A perfect example of this kind was drawn for the Museum. It was upon the labium major, and was accompanied with all the usual manifestations.

The General Eruption.

The general eruption of syphilis was seen seventy-eight times. The relative frequency of the various rashes is shown by the following list:—

Roseola with papules	32
Roseola	26
Roseola with squamous syphilide	3
Papules	7
Papules and tubercular syphilide	1
Papules and squamous syphilide	1
Condylomata	3
Squamous syphilide	2
Rupia	2
Lupoid syphilide	1
	78

This enumeration partially shows the polymorphism of syphilitic eruptions. In addition, seven of the cases of roseola had also condylomata, and they occurred once in conjunction with papules, and thrice with papules and roseola. The combination of papules and roseola was also complicated once with rupia, once with a tubercular and squamous syphilide, and thrice with a squamous syphilide. Once a crustaceous syphilide was combined with papules and a roseolous and squamous syphilide. Many of the multifarious syphilitic eruptions were not seen, and no vesicular or pustular eruption was admitted.

Deeply Pigmented Syphilide.

A most deeply pigmented syphilide was seen in the case of a woman aged 20 years. The patches were of a deep sepia colour. They were most conspicuous on the flexor surfaces, and were almost black in the groins, axillæ, popliteal spaces, and bends

of the elbows. The patches were the shape and size of ordinary roseola, and were not indurated. Indeed, an ordinary roseola covered the rest of the body, together with scattered papules. This pigmented eruption was painted for the Museum. The complexion of the patient was not particularly dark. She had other manifestations of syphilis, such as anæmia, alopeceia, angina, general lymphatic engorgement, and condylomata. Her symptoms rapidly improved under the usual treatment, but when she left the pigmented patches were still very dark.

No case of general syphilitic eruption was unaccompanied with anæmia. Often the anæmia was of the most extreme degree. Also hardly a patient escaped a severe frontal cephalgia. An inquiry as to headache was sure to elicit one of the most striking gestures of disease. The patient bent her head, and pressed the tips of her fingers simultaneously upon each of her temples, and sorrowfully shook her head.

Enlargement of the Thyroid Gland in Syphilis.

Although the point is not mentioned by authorities, yet I have observed a distinct enlargement of the thyroid body during the height of syphilis. For instance, a woman, aged 21, came with a roseolous and papular syphilide upon chest and neck, condylomata upon the tonsils and vulva, alopeceia, general lymphatic engorgement, and slight angina. Her thyroid body was enlarged about a quarter beyond its usual size.

This swelling of the thyroid gland was seen in other cases. A woman, aged 20, had had two indurated sores upon the vulva for two months. These were followed by local and general enlargement of the lymphatic glands, anæmia, cephalalgia, general roseola, angina, and condylomata ani. At this time, when the disease was at its height, the thyroid gland was distinctly enlarged.

Since we have learnt to look for this symptom, it has been frequently observed. I have no doubt but that it is of the same nature as the enlargement of the lymphatic glands. This is known to be due to vascular engorgement. I have several times seen in the post-mortem room that this was so.

Other organs may be enlarged at the same time as the thyroid. A woman, aged 21, was admitted with a sore upon the right labium minor, ulceration above the anus extending into the rectum, a papular and roseolous eruption, anæmia, and cephalalgia. She left on May 4, because she was pregnant. All her symptoms were much improved. In June she returned with a relapse of the local eruption, much roseolous and papular erup-

tion, condylomata about the fauces and tonsils, and general lymphatic engorgement. At the same time the thyroid gland was enlarged, together with the liver and the spleen.

A girl, aged 16, also had a considerable enlargement of the thyroid gland during the period of general eruption. She had had a sore upon the vulva three months before admission. We found the whole body covered with roseola, and likewise she had anæmia, alopeceia, angina, and general lymphatic engorgement. The thyroid was uniformly enlarged, but quite soft. Nothing of the kind had ever been noticed before. Her family was free from goître.

After a month's treatment with pil. hydrarg. all her symptoms abated, and the thyroid body returned to its usual size. This rapid subsidence is a point of difference betwixt the enlargement of the thyroid and that of the lymphatic glands. The general lymphatic engorgement does not, in my experience, depart for about nine to twelve months after the beginning of the disease.

A woman, aged 23, had an enlargement of the thyroid body. It was accompanied by a papular and roseolous eruption, angina, anæmia, and alopeceia. The sore was at the anterior commissure, and had not healed when the enlargement of the thyroid was seen by us. General lymphatic engorgement was present, but not in an unusual degree. The co-existence of gonorrhœa and papillomata with the above lesions seemed to have no bearing upon the enlargement of the thyroid.

Perihepatitis.

Pain under the right costal margin is not infrequent during the period of general eruption. Pressure makes this pain worse. It may be due to syphilitic perihepatitis. It was well marked in the case of a young woman who had a chancre upon the labium major, with local and general lymphatic engorgement, a squamo-crustaceous syphilide of the trunk and limbs, and condylomata. The hepatic pain yielded in this, as in other cases which I have seen, to moderate doses of iodide of potassium.

Another patient was thought to have had slight perihepatitis during the period of general eruption.

It is also possible that the kidneys may be affected during the general eruption of syphilis. One patient is said to have had a cloud of albumen in her urine. During the past three years I have had two gentlemen under my care both suffering from syphilis. Each had a faint cloud of albumen in the urine.

In one the albumen seemed to have a relationship to the mercury he was taking. This point is of extreme importance with regard to life insurance.

Iritis.

Iritis occurred in nine cases, all of a severe type. Fortunately, owing to the promptitude of the treatment, the eyes escaped without any damage. Of three cases, two had acute arthritis at the same time as the iritis, and one had dry pleurisy. This seems more than a mere coincidence.

A woman, aged 30, had iritis of the left eye. Her syphilis was of a severe type. She was admitted at the end of January 1895 with a horse-shoe-shaped chancre at the fourchette, and others upon the labia majora, enlargement of the inguinal glands, ulceration of tonsils, general lymphatic engorgement, roseola, papules, and pustules upon limbs and trunk. In April 1895 she was admitted again for extensive ulceration of the tonsils, and in May she was readmitted with iritis in the left eye. It is interesting to note that she also had effusion in the ankle-joint. In July she was again in the ward with a relapse of the iritis.

Iritis was followed in another case by arthritis of the left knee and ankle. A woman, aged 22 years, had a papular and scaly eruption upon the trunk and limbs, condylomata upon the side of the tongue, superficial ulceration of tonsils and fauces, anæmia, cephalalgia, and general lymphatic engorgement. She is said to have had rheumatic fever.

A woman, aged 18 years, had iritis simultaneously with a dry pleurisy. Her syphilis was of six months' duration. She had the scar of a sore upon the vulva, anæmia, general lymphatic engorgement, roseola and papules of limbs and trunk, and superficial ulceration of the mouth, tonsils, and larynx. She likewise had gonorrhœa.

A woman, aged 36, had severe iritis of the left eye during the period of general eruption. Her syphilis was probably of five months' duration. She had anæmia, cephalalgia, general lymphatic engorgement, roseola, papules, and condylomata. Later she had a tubercular syphilide of the face, which was most inveterate. An attack of gonorrhœa with a labial abscess seemed to have no relation to the iritis.

A woman, aged 33, had iritis of the right eye. A month before she had been treated in the Surgery for condylomata, œdema of labia, and a vaginal discharge. When admitted with iritis, she had a polymorphic syphilide of the whole body.

It consisted of roseola, papules, tubercles, and scaly patches. Anæmia and general lymphatic engorgement were marked.

A woman, aged 32, had iritis of both eyes. Her body was covered with a papular eruption, with inflammation and superficial ulceration of the throat. She had a circular ulcer upon the dorsum of the right foot, which might possibly have been the seat of inoculation.

In the case of a woman, aged 34 years, iritis occurred during the fourth month of syphilis. The patient had anæmia, general lymphatic engorgement, superficial ulceration of tonsils, a papular eruption, and condylomata. Only the right iris was inflamed, with much lymph.

A girl, aged 7 years, had iritis of the left eye. The syphilis was congenital. A gumma had broken down in the neck leaving an ulcer over the thyroid cartilage. Other gummata were situated upon the upper and lower ends of the right tibia.

One of the adults had gumma due to acquired syphilis, complicated with iritis.

Gummatous Stage.

Judging from old accounts, the disease which we had to treat was not of such a severe type as those which used to be met with; but the old accounts may, of course, be fallacious. There is an obvious tendency for every one to write about that which is unusual, a knowledge of the usual being taken for granted; but many of our cases of gumma and of congenital syphilis were of the severest type.

A woman, aged 34, had gummata of tongue, elbow, knee, and of the scalp, with superficial necrosis of the frontal and parietal bones. The knee is a favourite region for gummata, as was shown in this and several other cases. The ankle, too, is a favourite seat. Generally speaking, our cases bore out Sir George Humphry's dictum, that ulcers away from the thin part of the leg are always to be suspected.

A woman, aged 47, had tubercle of the lung, and gummata upon the bridge of the nose, elbows, knees, lower third of legs, and upon the thighs. Tubercle bacilli were found in the sputum. Although her syphilis was severe, the phthisis seemed to make no difference in the treatment or its result. I have often been surprised to see very delicate, and apparently phthisical patients, recover rapidly when attacked by syphilis.

A woman came in 1894 with gummata of the scalp, rupia of the back and face, deep ulceration of the tonsils and pillars of the fauces, and a node upon the tibia. The havoc which syphilis may do is exemplified by her history. Ten years ago

she contracted syphilis from her husband. She was treated for eighteen months at the local hospital. Six years ago she had gummata of the scalp. Three years ago she began to have epileptic fits, which have since recurred every two or three months. Two years ago she attended at the Lock Hospital for an ulcerated throat. Since contracting syphilis she has had three miscarriages and five still-born children.

It is unusual for adults to die from venereal disease. A married woman, aged 36, was admitted with ulceration of the vulva. It had existed six months, and was complicated with a suppurating bubo of the right groin. This was followed by acute inflammation of the pelvic lymphatics, and subsequently by thrombosis of the femoral and iliac veins and of the vena cava inferior. She died suddenly of collapse. At the examination the peritoneum was inflamed in the region of the cæcum and in the pelvis. The lymphatic system seems to have suffered most. All the retro-peritoneal glands were enlarged, and the vena cava inferior was obliterated by their pressure, thus accounting for the thrombosis. The labia were much thickened and ulcerated, but this was unaccompanied with any confirmatory evidence of syphilis.

Congenital Syphilis—Death from.

A female infant, aged 7 weeks, died of congenital syphilis. She was admitted very wasted and anæmic, with a polymorphic eruption. Upon the face were papules and pustules; the body and limbs were covered with an erythematous rash, and the genitals and anus with condylomata. There was marked snuffles, and doubtless from the history the infant had had pemphigus. Ulcers formed wherever the skin surfaces rubbed together. Death occurred quite suddenly. Mr. Berry found nothing at the examination but pulmonary collapse.

The late kind of congenital syphilis was illustrated by several cases. None of these have any feature which calls for comment.

Treatment.

To obtain satisfactory results, the course of treatment for an ordinary attack of syphilis lasts eighteen months or two years. It ought, therefore, only to be undertaken upon the clearest evidence. If there be doubt as to the diagnosis, time will set it at rest. A patient seldom or never persists with the treatment when the diagnosis is doubtful. If no further symptoms

were to appear after the treatment had continued for a few months, the question obviously arises whether this was due to the remedy or to a mistaken diagnosis. Under these circumstances I have known the treatment to be dropped, and a most serious relapse to have ensued.

Subcutaneous Injections.—Several cases were treated with subcutaneous injections of mercury. The good results of this plan are so obvious to the patients themselves that they at once overcome any dread they might have, and were always willing and anxious to continue. Dr. Hale White has given the simplest directions. A grain of pure perchloride of mercury is dissolved in a hundred minims of distilled water. Ten minims of this solution are injected with a hypodermic needle into the substance of the gluteus maximus. An injection twice or three times a week seems to be enough. We never had any ill effects from the pure perchloride, but I thought the result was better if, before injection, it was converted into bin-iodide. This is done by simply adding iodide of potassium or of sodium to the solution of perchloride until all the red precipitate is dissolved. The good results of this treatment were very marked in a case of intractable syphilis of many years' standing. In it administration by the mouth was forbidden by ptyalism to the extent of looseness of the teeth. This was not aggravated by the subcutaneous injection of from $\frac{1}{12}$ to $\frac{1}{6}$ gr. Indeed, we found this one of the great advantages of subcutaneous injections, namely, that they allowed the treatment to be continued when it had been rendered impossible by the mouth or skin.

We also gave a trial to hydrargyrum glutino-peptonatum, which has been advocated by Dr. Eichhorn. We found it unirritating and apparently efficacious, but it seemed to have no advantage over pure perchloride, and not to be so good as bin-iodide. Intravenous injections after Bacelli's method were not attempted.

Generally speaking, we have found the old rule of treatment holds good, early dry syphilides being best treated with mercury, and suppurating and gummatous syphilides with iodides. One of our great difficulties has been ptyalism, caused by previous reckless dosing. A grain of blue pill thrice daily is all that is required, and is the routine prescription. Iodide of potassium was given in doses of two or three grains, in accordance with Mr. Hutchinson's emphatic recommendation. These small doses are less depressing, and quite as beneficial, as the larger ones which some surgeons order.

The great value of opium in the treatment of phagedæna was shown by its effects upon some phagedæna of the inside of the

cheeks. On the right side the cheek was dusky red, with much swelling and induration. Inside the mouth there was an acutely inflamed and irregular ulcer, covered in places with an ashen slough. The left cheek was ulcerated in the same way, but not so badly. The limbs were covered with a crustaceous syphilide, and the trunk with roseola. The ulceration was very painful, and spread over the gums and hard palate, and invaded the soft palate and pillars of the fauces. The day after admission her temperature was 102° F. The mouth was treated with chlorate of potash. Iodide of potassium was given together with full doses of opium. The phagedæna soon ceased and the opium was discontinued. Within a few days the ulceration began again. Opium was repeated, and the ulceration ceased.

Phagedæna, which had destroyed the nymphæ and neighbouring parts, quickly subsided under the influence of opium, immersion in hot water for four hours daily, and the local application of that excellent drug potassio-tartarate of iron. Occasionally the ulcerated surface was swabbed with pure carbolic acid. We saw nothing to confirm Mr. Hutchinson's opinion that phagedæna is in itself syphilitic. Indeed, all our observations tend to controvert that assumption.

A great many local applications have been tried.

Owing to its tell-tale odour, iodoform cannot always be used for venereal sores. I have always thought potassio-tartarate of iron, in a solution of five or ten grains to the ounce, equally efficacious. A woman, aged 29, rapidly recovered from two large irregular ulcers upon the inner sides of the labia minora, accompanied with gonorrhœa. They were treated with hot baths and solution of potassio-tartarate of iron.

The old-fashioned gargles have never been used except as mouth-washes. A spray containing perchloride of mercury, with a little cocaine, gives very speedy results in ordinary syphilitic angina, out-patients can buy an efficient spray for less than a shilling. Those which are sold for scents are quite good enough. It seems most unreasonable to use gargles. The act puts acutely inflamed and ulcerated organs into violent action. Moreover, many gargles are in themselves highly irritating. Dusting with finely powdered iodoform is also very useful in syphilitic ulceration of the throat. No ill effects have followed this way of using iodoform.

The old-fashioned black-wash also has seldom or never been used. Iodoform is more efficacious and not painful or irritating. Iodol, aristol, and europhen were tried upon various occasions, but the result was unsatisfactory.

ON CELL-MEMORY.

BY

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In considering the brain as the organ of mind, we apparently postulate two things: first, that there is a "brain," and then that there is a "mind," and that the two things, however closely they may be associated, are not the same thing; that though the one may be necessary for the manifestation of the other, still brain is not mind. To say that mind is brain in action is to say that in deep sleep, the hypnotic state, chloroform or narcotisation, &c., there is no mind, because there is no manifestation of reaction to stimulus of any of the sense organs, nor is there any token of the presence of images, concepts, volition, or consciousness.

Yet when the temporary condition, whether of sleep or narcotic poison, has passed away, mind returns, as active as ever. Where has it been, if we are to speak of mind as an "it" at all? Where or in what condition have been all the memories, ideas, associated groupings, characteristics, all the knowledge that we recognise on its return to be much the same in character and composition as it was before? We say that they have been "locked-up" in the brain, by which we mean that a certain condition of brain matter has for the time being been suspended in action—a certain condition that when *in activity* means mind, a condition that represents the transformation or modification of the external world and the forces in connection with it on the individual during his whole existence; in other words, a modified structure.

What is this modification? Modern psychologists, unwilling to accede to any doctrine of a separate "mind" or "essence," which functions well or ill according to the quality of the structure of the brain, unable to conceive of the doctrine of "psycho-physical parallelism" as explanatory of the co-ordination of physical processes in the brain with mental processes, have come to the conclusion that there is some

peculiar modification of the brain cell, and possibly of its processes, which makes it a different thing after the reception of an impression from what it was before, which goes on through the various nutritive changes of the cell, which in normal conditions is a latent power until it is called into action, and which is a permanent state during the life of the cell. In his recent work on "Human Psychology" Wundt ridicules this idea, and makes merry over the absurdity of this modern phrenological hypothesis, but he gives nothing in the place of it. It is true that we cannot tell by microscopic inspection or analysis of any kind what the change is, though it has been recently demonstrated that there is an actual change in volume in a cell that has been functioning; but then we are equally at a loss in recognising any difference in the particles of a piece of metal which is transmitting an electric or galvanic current or force of any kind, though we are tolerably certain that there is a change. No one supposes that the actual shape of a house or of an individual is impressed upon a single cell or a group of cells, but if an optical sensation of a house has not impressed the cerebral cells of the visual centre in some way, how are we to account for the consciousness that such an object, on its re-presentation, has been present before, or how can the idea of the object be at some time called up, either voluntarily or by association or contiguity? This much is certain, that the molecular condition of a cell or group of cells which is in process of action is different from what it is in the quiescent state, that there is a real destruction of cell plasm, most probably of a chemical nature, and that this loss must be made good in a manner calculated to continue the changed condition of the cell. But supposing this is true, there are still some points requiring elucidation. We may allow that a cell that has received an impression, or has been molecularly changed in correspondence with an impression on a sensory nerve with which it is in connection, retains a nutritive memory of that impression, but is it (we may ask) capable of receiving an impression of another subject? Can the same cell serve for different impressions of the same class of sensation, or must each separate and distinct sensation have a different cell for its conscious interpretation? Suppose, for a moment, that an animal or an organised being had only one cell in connection with a perfect sense organ, would that cell be capable of receiving and elevating into consciousness only one object, or would it be capable of more than this? Say that an orange was presented to the eye, and on representation was recognised as having been seen before, would that

same cell be able to serve as the means of consciousness for an object presented of a totally different nature, or would another cell be required for this? If one cell is sufficient for the mental interpretation of more than one sense-presentation, what is the object of the immense number of cells in the various centres? There must still be thousands of unemployed cells, even if for each fresh sense-presentation a new cell is required; for there certainly seems to be no end to any one individual's powers of acquisition, and nobody will contend that any lifetime has yet been long enough for the store of observation-powers to be used up. We go on learning and receiving, and yet there is room for more, and new combinations and associations arise, and still there seems no end to their possibilities. The operation of fatigue tends to show that different cells come into play with change of subject. When a certain group of ideas or images engrosses us for more than a short time, there is a sense of pain and weariness which is only relieved by a "change of subject." What can be the interpretation of this but that an entirely new set of cells is brought into play. Indeed, the essence of treatment is to produce that change which means rest, not necessarily inaction, but transferred action, the play of other groupings as far removed as possible from those whose excessive functioning is imperilling the nutrition of the structure. If there is anything in emotional expression, the meaning is that certain muscular positions are definitely grouped with certain central psychical processes, and that as long as these latter persist the former are evoked, most probably unconsciously at the last; but before this unconscious union is arrived at the strain may have been so great as to break down the tissue which change to another condition might have relieved. When a person in a state of melancholic depression, with all the outward signs of the internal process, is suddenly changed to a joyful state with its corresponding muscular exhibition, will any one say that the change in psychical condition is merely another mode of functioning of the *same* central cells in the latter as in the former case? That surely would mean that the expression of emotion has no value at all, or that the same cells can at one time or another work in different and opposed combinations.

We must agree with Wundt that an idea is never renewed in precisely the same terms as the original one, but it does not therefore follow that in so far as it does resemble the original one, the identical cells and processes are not engaged in combination, possibly with others with which they are brought into relation according to the laws of similarity and contiguity. The

circumstance that new processes exhibit relations and similarity to others previously existing can no more prove the continued existence of the idea as such than it can be inferred from the similarity of the movements of the pen in writing a definite word now to that involved on a former occasion that this movement has continued to exist in an invisible form from the time it was first made (p. 237). But if it does not prove that the same path is followed in the revived idea as in the original one, and that the process is a repetition of the original one, rendered, too, more easy of production by the modified functioning power of the cell, what does it prove? Why, that consciousness of the past is quite impossible of comprehension. Of course "the idea as such" and "the movement" have not actually continued, but the condition of the cells and intercommunicating fibres must have remained the same as when they were brought to function on the first impression. If there is no modification in the molecular condition of a cell that has received sense-impression, what is the use of practice? And if no permanent cell-memory exists, how have we the consciousness of previous impressions and processes? If we reflect upon our course of mental life and verbal expression, it is extraordinary what a small (comparatively) number of "ideas" and expressions we employ. It is only the combinations that give variety to our physical conditions. A small vocabulary of 400 words is sufficient for most people, and the most versatile and prolific authors have been reckoned to use only about 10,000 words. What difficulty is there, then, in contending for one cell one impression? Certainly none as far as number goes; and if this is allowed, then is there none in the potentiality of combination? The argument from what occurs in maniacal conditions may help us. If we listen to the talk of a person suffering from acute mania placed in a separate single room at night, and thus as far as possible removed from the influence of external sense-impressions, we notice that the conversation is simply the letting-off of cells charged with impressions of various items of previous experience, or of answers to hallucinations of various senses, and the stimulus or excitant is either disordered blood or a morbid irritant constantly acting on the cells, or some of them, and keeping up the action as long as it remains. Now here is a condition due to internal conditions alone; there is no external cause or environment to set up sense-images or ideas (beyond the subjective hallucinations), and yet there is most elaborate and prolific cell-action, for of course it cannot be action of any other than the cell-structure.

The random groupings may, if we are fairly cognisant of

the patient's past experience, be reduced partly to some coherent associations and partly to new excitations, started most probably by the changing locality of the central irritation. This excessive and continued functioning leads finally to destruction and death of the cells, which become wasted, and resign their places to inert fluid or coarse obstructive growth. If this process is not a re-excitation of cells affected in a certain manner, what is it? There is no objective irritation; in fact, the patient may be so affected that objective irritation is impossible, and his manifestations of mind are purely those of the past, an unchecked liberation of stored-up images. We can only conceive of this process as one of rapid destruction and reparation, and we may possibly yet see the actual change of this physical process thrown upon a screen.

In using a word to designate an object, we generally imply a complex idea based on impressions of different kinds of cells, disease or disorder of any one of which kinds may lead to disarrangement of the whole concept. Thus, in speaking the word "orange," the idea presented is a complex of impressions of different kinds, such as a round object with a certain colour, smell and feel, and it is as sure as anything can be that different groups of cells are concerned, so that whilst one cell or group gives the idea of roundness, another group gives that of smell, and still a third that of colour, all eventually combining to give the total idea expressed by the word "orange." That one cell is necessary to one kind of impression seems to be shown by the fact that a man born blind who afterwards gains sight has a very different idea of the qualities of an object from what he had before, because a new factor or group of impressions has been introduced which was hitherto unaffected by the existing stimuli; whilst if a man who has enjoyed eyesight becomes blind, the idea of colour still remains, because of the permanence of the impressions that remain in the cells, although the medium of direct external stimulus is removed. It becomes now easy to see how a deluded condition may arise from the affection of one group of cells, so that a person showing delusions of a general nature may be only primarily affected in one centre, the irritation from which, by the laws of association and contiguity, temporarily affects the others. In all deluded states, therefore, we must seek for the primary offender. What is required for the more perfect treatment of insanity is, then, a more accurate physiological knowledge of the conditions of the cell-life of the brain—for at present we know almost nothing about it. We stand in impotent astonishment at the irrepressible mental and motor processes that go on in a person suffer-

ing from acute mania, because we can only guess at the part primarily affected, and are ignorant of the conditions of its exercise of such superabundant energy. We feed the patient—and here we are probably correct—we give narcotics in a blind way, and for anything we know may be increasing the mischief; or we administer a powerful alkaloid to subdue some troublesome symptom, to contract or relax the small arteries, but chiefly because of the ignorance of cell-functioning the exhibition of these remedies is little more than empirical. Should we be any the better off if we did know these physiological conditions of brain action? One of the greatest difficulties in dealing with brain disorder is the inaccessible nature of the defaulting structure. At present we get at it chiefly by the circulation, and direct medication is unfavourably looked upon, involving as it does surgical measures of a protracted and difficult character. Is it, however, unreasonable to hope that surgical interference, the actual scooping-out of a diseased group of cells, will not in the future be more useful than the leaving a person to feeding, out-of-door exercise, and drenching with sedatives? All around us we can see persons showing symptoms of cellular irritation for years, calling out for that something to be done which at present we are unable to do, until at last the cry dies out, and there remains but a helpless wreck of dementia, fit only for speedy removal. That the proportion of insanity in the general population remains about the same, or, if it changes at all, has a tendency to increase, points to no improvement as to the causes, whilst statistics seem to show that the proportion of cures does not materially increase, and one asylum turns out practically as many cures as another. The same thing could not be said of those affections of the nervous system that are included undert he head of neurology, a division where of late years surgical treatment has had a most marked effect in a favourable direction. In the treatment of visceral disorders in general, the introduction of an extended use of surgery has been followed by most gratifying results—results that would much surprise the practitioners of bygone days, and here again the statistics of one hospital are pretty much the same as those of another, that is to say, that given a line of treatment, individuality counts little for success, but one set of men is practically as good as another. So in the treatment of insanity, the successes of one establishment about balance those of another; but we await the pioneer who will teach us how to change the monotony of the yearly percentages of cure, and will point out new means for preventing the increasing heap of dementia—*i.e.*, failure. We may take two persons

whose sense-organs are to all tests and appearances perfect, and similar in structure, conducting power, &c., and we note that whilst one is passive or gloomy in his reaction to certain objective impressions, an opposite effect is produced in the other, for no other reason that we can see but that a different central constitution is at the root of the emotional difference. What is the cause of this emotional difference? An attack of insanity supervenes, and an emotional trend of a directly opposite character follows, though the same cells and their connections are brought into play. There must be some change in the physical state of the cells to bring about this difference of feeling, and thus we conclude that the same cell is capable of setting up and of reproducing different emotional states according to alterations in its physical condition. Of course, we must concede that gloom or brightness of feeling depends to a great extent on the chain of ideas aroused by an impression, and therefore upon previous experience; and as a cell or group of cells may be in connection with others of either a depressed or of a joyous character, so the diseased process may affect one chain or the other, and evoke a corresponding emotion—*i.e.*, idea *plus* feeling. If so, then it is not an actual physical change in the cell that is the cause of the change of emotional content, but the continued irritation of a combination of cells and processes always associated with a kind of feeling that is at the root of the change we started with to discuss. Still, there seems little doubt that the quality of feeling and its perception do vary in individuals, and that this personal factor is constitutional, and based upon some cell-difference that so far we have no clue to. And this different qualitative condition of feeling will affect also the emotion, which is simply the union of feeling and idea, and finally passes on to affect the will. So that the same external impression may lead to diametrically opposed emotional states and acts of will, because (chiefly) of a different physical condition of cells which we are unable at present to grasp. But this is coming very close to the question of responsibility, for if through disease or original structure external impressions lead to dangerous acts of will through an alteration in the emotional state, the plea of irresponsibility can be fairly raised, and those physiologists who argue for the criminal type of brain, basing this type on the structure of cells and location and size of convolutions, which for practical purposes are only collections of cells, may be nearer the truth than they are generally credited with being. What a help it would be if we could say with certainty, "The external irritation of this cell or cell-

group should be attended by a certain quality of emotional trend; but we find instead that this normal external impression causes a contrary feeling because of the particular structure of the central cell-group." As it is not likely that we shall be able to do this, we shall still have to judge of the sanity of a man by his acts, whereas we ought to be able to say that so-and-so is mad because his central structure forbids him to be otherwise. And if this central structure were more accessible, we should do so oftener than we do at present. Crime and wickedness may even now be traced to bad structure in an incomplete way, but a good deal has to be done before the proof is complete. We stand helpless before a case like the following:—A young woman was brought to me to-day whose insanity rests on her *ipsa dixit*, for verily there is nothing to prove it beyond her own assertion that she should do a certain thing if she got the chance. Just as a man says that he has a pain here or an ache there, and you cannot swear that he has not, so does this woman say that if she goes home she shall certainly kill her children. Here is a woman with no hallucination, no delusion, no strangeness of conduct, no alteration of expression, no sign of insanity discoverable by any physical process that we know of, and yet we have not the courage to discharge her because she says that if given her freedom she must murder her children. In order to test her, the nurse (though acting in this matter without authority) gave her a couple of live mice, when she immediately strangled them in a most determined manner, as though the sight of a living thing at once created the impulse (a simple voluntary act) to destroy it. Protracted worry and anxiety are the ostensible causes of this (as we believe) truly diseased state, and we take refuge in the explanation that there is want of inhibitory power due to a reduction in the development of the "highest plane," the last developed and the most complex. Intense feeling leading to action must be the mental condition here, and since in a normal state this feeling would be "controlled" (in both cases there is "idea" present), we can only conclude that the memory-cells, which in ordinary circumstances form part of the association-chain of ideas that are really the counterbalancing or "controlling" agent, are impaired or unable to function. To express the condition fully, the sight of this woman's children arouses in her so strong a feeling, combined with the idea of killing them, that action ensues at once without the possibility of the original idea connected with the sight of the children being brought into association with the cell-memories of love and care for them which in her normal state was the usual sequence.

Is it not allowable to suppose that, owing to some nutritive change, these associations do not take place, are structurally cut off, temporarily or permanently, and that in this way control (*i.e.*, opposing cell-memories) is impossible? Want of power to control herself is then reduced to absence in consciousness of previously associated cell-memories, and there can be no "will" in her case, because (to quote Wundt) the criterion of voluntary action "that the thought of the end to be realised accompanies or precedes it," is absent. From this point of view it is scarcely necessary to suppose a "higher controlling centre" in a case like the present, for this leads to the supposition that a definite series of "controlling" cells is out of action, and that "lower centres" are functioning in an irrepressed manner; the actual case being that a process of nerve-action is simply rendered incomplete by disease of some part of the circuit. Where are the special "controlling cells," and why and how is the inhibitory process impaired, other memory-cells remaining unaffected? What makes a man commit suicide is based on the same reasoning as in this homicidal woman—a chain of events like the following of intense emotional trend, impulsive action in accordance with the cell-memories functioning, and failure of other associations, either from disease or causes closing the paths.

If practice is necessary to the complete functioning of associated ideas, there must be some molecular change in the track thus freely used that renders it easier for the passage of nerve-force than an unmade path; but how we are ever to arrive at the objective demonstration of such paths seems at present to transcend aspiration, and though we may fairly conclude that defective inhibition is due to break-down of association, the test of it (beyond in most instances the act itself) seems as far off as ever; and Dr. Maudsley is most probably correct when he says that each case must be judged on its merits. The theory of impaired association through damaged intercellular connection explains those cases where an impression is made, or an idea springs into consciousness, but stops there, and the final movement is not completed, as in hysteria, hypnotic suggestion, &c. In no condition so well as in intoxication or chronic alcoholism do we see disordered association or cell-connection portrayed, and the acts of these people either stop at the formation of images, or pass into broken up and irregular associations, conspicuous by the absence of complex voluntary action. What is the nature of the process that occurs in people who have lost their memory, and who, as is generally seen, become impulsive? The destruction of the vitality of the

memory-cell must be very great indeed; it seems as if it was incapable of receiving an impression. To quote an existing case; there is a woman in this Hospital who does not remember her maiden name, nor that of even one of her three husbands, nor the fact that she made a pronounced suicidal attempt; though she cannot remember her own name, she will respond and turn towards the person who pronounces it. It seems here that cell-memory is not entirely obliterated, otherwise she would not respond to her name nor recognise it as her own; but much of it is impossible, because she is unable to recognise a person whom she has seen only a short time before; and though the cells seem for the most part to be capable of receiving an impression, they are unable to retain it because they must be so near absolute degeneration. With the destruction of so many cells and their associative processes, such a person must act upon impulse, and will must be impossible. If we could extract a few cells from this woman's convolutions, there is little doubt that they would be found to be in advanced degeneration.

A curious question arises with regard to those cases where, after an illness, a total loss of memory is reported of a language that is afterwards successfully re-learnt. If such cases have been correctly reported (and it is not here meant to include cases complicated with hemiplegia), the problem is a very difficult one to solve. It cannot mean that the other side of the brain is gradually educated, because if homologous parts of the two hemispheres are in health connected, we cannot conceive of either being brought into function without at least some memory of the former presentations; and if this theory does not suffice, then we must conclude that entirely new cells are brought into action and gradually educated. This seems to be so difficult an alternative that we are obliged to doubt if such cases have been really correctly reported. Every one in large lunacy practice is familiar with cases of narrow groups of delusions, the conduct being co-ordinately influenced within the circle of the delusion and its associations, but not (as far as we can see) preventing the individual from talking and acting rationally, in fact in a trustworthy manner, on most other subjects. It is a dangerous doctrine to advance, but it is practically true, that as long as the disease is confined to the immediate group of cells connected with the disordered associations, patients, even though the delusion may be of a supposed dangerous character, may be trusted, and are, as a matter of fact, so trusted in everyday asylum experience; and it has always struck us as being a most extraordinary thing

that, with all the violent language and other accompaniments of insanity existing in such wealth in asylums, there is yet so little actual violence or threats of it, much less, indeed, than would be met with in an equally large congregation of sane people. What is the cause of this? It is said that the patients are kept under "discipline." But if they are amenable to discipline there must be collections of cell-groups with their memories unaffected and associated with others in a manner quite independent of the diseased set. As long as the disease is confined to one part, there would seem to be no reason why confidence in the individual should not be continued, but we know that new associations may be formed with the diseased group either by disease or by chance circumstances, and therefore, in distrust of what might occur, we keep the "harmless" patient under restraint. In speaking of various forms of insanity, we seem to imply that distinct tracts are invaded: thus we speak of a person having "large delusions" or "delusions of persecution" or "altruistic delusions." Does this imply that in the various forms certain tracts of associated ideas, and those tracts only, are diseased? It would seem that primarily this must be so, and that if a case of this nature pursued its course without change to a fatal termination, we ought to be able to trace post-mortem the chain of diseased cells, or at any rate those in which the mischief began; but even then, be it remembered, we should only expect to find signs of irritation or of excessive function, not of decay; for as long as function lasts there must be a certain amount of cell-integrity. There cannot be destruction, otherwise we should have a condition of dementia. Future research may succeed in demonstrating these lines of abnormal irritation, and it may be possible to forecast the particular spot in the convolution that is at fault. For instance, in a classical case of general paralysis, delusions of wealth and power are universally present (allowing that even here there are occasional exceptions in which patients have depressed delusions with refusal of food), but the tract of brain-matter in action, of which these delusions are the outward expression, must be a limited one, and would, we might expect, be demonstrable under proper treatment, be in fact localisable; and just as we now can accurately determine the actual brain-spot of certain muscular affections, so may we eventually be able to point to the centres of delusional groups and treat them as successfully as we do the former. Insanity is, as a rule, a long-lasting disease, and during its progress there is therefore so many changes in so many different tissues, that post-mortem localisation is usually impossible; but we may reasonably hope that

an examination of rapidly fatal cases, where the symptoms have been well observed, may lead to the localisation and future generalisation of special tracts, a direction in which physiology and pathology will assist each other.

We have now arrived at the point when it is necessary to mention another way in which cell-memory may be performed, and one that seems to have much to recommend it. Take the sense of touch. It may be said, that inasmuch as all impressions of touch are practically due to variations in the degree of pressure and temperature, and all our ideas of the condition of an object are derived from the associations of this one with the other senses, therefore the same cell or cells will time after time receive the primary impression, and by virtue of connection with cells of other centres in a changed series give rise to different conscious processes or concepts; that therefore it is unnecessary to conclude that one cell is capable of receiving only one impression, but that it may receive a practically unlimited number, and that it is by association with other groups only that differences in objects are recognised. If this is advanced, it is difficult to understand how we may have, as can be proved by experiments, four or five disconnected impressions distinctly perceived at the same time, and possibly even more by practice. For instance, I see before me a chair, an electric-bell, and a hat, as the result of three distinct visual impressions. I turn away, and have these three objects in distinct consciousness projected externally, as sense-impressions are, no one apparently more distinct than the other, and no succession in mental vision being traceable. It is scarcely possible to conceive that the cells which received the primary impressions are the same in all these instances, and that cells which received the impress "chair," and formed associations with other experiences derived chiefly from touch, can be identical with those receiving the impresses "hat" and "bell," and all their different associations; for if so, what is there to prevent us when we see a chair, thinking it is a hat or a bell? It must be borne in mind that "associations" are really the connected cell-memories of former impressions, and that these may be confined to one particular sense-organ, and may never have been brought into relation with other senses. This seems to demonstrate conclusively that different cells are required for new impressions, for the same cells cannot give us the consciousness both of something that we have never seen before and also of what we recognise as having formerly met with. It may be admitted that there is a fundamental difference between the cells connected with the different sensory

organs, so that a light-impression would have no effect upon an auditory cell, and it is allowable that different kinds of cells are connected with the perception of different colours, sounds, &c.; but, according to those who hold the theory that we are discussing, this seems scarcely sufficient to account for the extraordinary number of our associated memories without the further assistance above indicated. As a fact, we have very few really new ideas. When we see or hear anything "new," it is generally only a rearrangement of old impressions; we recognise all the old colours, sounds, &c., and so a man of large experience comes to the conclusion of the "sameness of life;" he meets with nothing that gives him the consciousness of something different—something more than a *rechauffé* of old memories; but it does happen that, by some chemical or other process, an element is elaborated that gives a "new sensation," which arouses sensory impressions that he does not remember to have ever before experienced. What can this mean but that cells are brought into action that have never previously functioned; and if so, it is possible that there are agencies around us that, in the form in which they exist, are incapable or inadequate to stimulate the structure that is, and of which, therefore, we must be unconscious—we, that is, as a body, though there may be individuals susceptible to such excitation. On the other hand, it is against evolution that structure should continue to exist which is not called upon to function, and the prospect of inert matter waiting for a chance stimulus, which may never for that individual arise, is very difficult to explain. One would think that such structures would in time disappear altogether. We all along meet with "peculiarities," "individualities," "idiosyncrasies" that we cannot explain, and that at present are only met with by disbelief or are ascribed to "imagination" (as if imagination had anything but a material basis). Without for one moment giving in the least adhesion to the rubbish and nonsense written by believers in the spirit-world, &c., we may concede that it is not only possible, but even probable, that circumstances may have arisen to one or more individuals in which external impressions of a new and before inexperienced kind have set up central cell action quite different from any existing memory, and therefore to those individuals new, and, as far as can be demonstrated, new to others also, to be found in no record. The rarity of such occurrences makes it, however, very doubtful if they really exist at all; the temporary irritation of memory-cells is quite sufficient to explain the external projection of images and all their associations. There may be conditions of matter—indeed there are—going on

around us which we have not the apparatus requisite for translating into another form, but that is no reason for saying that such a condition of things is permanent. Far from it; we may well conclude that the molecular changes which ensue in cells consequent upon stimulation render them capable of potentialities higher than they possessed before, and that it is in this way elaboration of structure occurs; for we have no proof of the growth of new cells, nothing to lead us to say that as the brain grows older so does the number of cells increase. An objection to the theory of one cell one memory might be raised, that in this case human intellect must be finite, that it is conceivable that in course of time all the cells would be used up, and that, though new kinds of impressions might arise, there would be no material left to act upon. It is very likely that human potentiality is finite, but the question is one too large to discuss here, and we can only repeat our conviction that not only are the cells sufficiently numerous for any possible contingencies that arise, but that many are never even called upon to function at all. And now comes a very difficult "internal" psychical question. Up to now we have considered that cell-memories are the result of impressions from without, but this cannot be all. What happens when the rise of cell-memory and associations take place from within? It is difficult to imagine such a process arising spontaneously; it probably never does unless in disease or in expectation, which means continued functioning. And when it occurs, the result may be a conclusion that can be traced to the same mechanism as we have already considered in external action. There is a patient here whom we suppose to have primarily disease of the cells immediately connected with the auditory apparatus. He hears voices constantly repeating words, and these being projected externally, and constantly arising without any visible cause, he naturally attributes to an "unseen agency," and the various associations aroused by the excited tracts lead to conclusions just as bizarre and unexpected as might arise from a normal process, the only difference being the "damnable iteration" that prevents the diseased man getting relief from other sources whilst the disease lasts. We see no reason why in this way a brain may not be educated in a "morbid" strain just as in a "sound" one, and it is evident that the morbid consciousness must, from its never-ceasing activity, be a reality the intensity of which a sound mind can scarcely conceive—hence the pronounced character of the madman's acts.

It seems to be in the nature of things that the study of the elaborated product of an organ precedes that of the organ itself.

The composition and nature of urine and bile were investigated long before the minute structure of the kidney and liver; and as for Thought, it was discussed in schools long before even its seat of action was determined. This is not to be wondered at, for products are more accessible to examination than the producer, and the coarse variations easier of detection, whilst it is generally easier to say what is wrong than to define the defect in the structure that is at the root of the evil. The difficulty is immense in psychological study. A specimen of urine may be normal for the particular condition of the kidney at that time, but it may be very different from another specimen which is quite as normal for the condition of the kidney at another time, and what we call a "morbid" urine may be the fitting product of a "diseased" kidney. How much easier is it to recognise the faulty product here than to say what is the disorder causing it. And so we recognise an action or an expression as faulty or "diseased" which is the only possible result (whether by a causative or a parallel process) of certain changed internal conditions. What these are we are all endeavouring to ascertain, but we are yet a long way off knowing the even elementary conditions of functioning.

ON CALCAREOUS MASSES EXPECTORATED FROM THE LUNG.

BY

SAMUEL WEST, M.D.

Calcareous masses are occasionally brought up from the lungs. They are usually of a greyish-white colour, gritty and hard, but sometimes of a soft, putty-like consistency. They are composed of phosphate, and sometimes, it is said, of carbonate of lime. They vary greatly in size and shape. They may be minute, and not larger than a caraway-seed, or as big as a nut and weigh many grains. They may be cylindrical, oval, globular, pyriform, or quite irregular in shape, and they may also be branched. Their surface may be smooth, but it is usually rough and ragged.

The lung lesions with which they are associated, if any, are those of chronic phthisis; but calcareous masses may be expectorated for years, and yet no signs of pulmonary disease of any kind become manifest.

They vary also in number, from a single one up to many hundreds, *e.g.*, 500 in a case recorded by Portal.

The frequency with which such expectoration occurs is small. I only know of one set of figures which deals with this question,[1] and that shows a frequency of 16 in 1000 cases of phthisis; but I think this yields an unusually high percentage.

Source.—Early writers supposed that these masses were calcified or cretaceous tubercles, and thus Bayle and Portal speak of "Phthisie calculeuse." Andral, whose description of the affection still remains one of the best, referred these matters to four sources:—

1. The interior of cavities in the lung.
2. The lung-tissue itself.
3. Calcified bronchial cartilages.
4. The interior of bronchial tubes.

[1] Williams: Pulmonary Consumption.

It is strange that he should omit from the list the mention of calcareous bronchial glands, from which source most of the masses undoubtedly come, especially as in one of the earliest cases recorded by Bayle post-mortem examination showed the presence of calcified bronchial glands.

There is, I believe, no pathological evidence to show that the contents of the bronchial tubes, whether ordinary bronchial secretion or blood, can inspissate and calcify. Even where the mass is branched, the branching is somewhat fanciful, and not other than might be obtained from an irregularly calcified gland, for in such glands the deposit, if lime salts, is often very irregular.

Calcified bronchial cartilages we should *à priori* expect to be but rarely expectorated. Case 8 is an instance of this kind. Calcified tubercular nodules might of course be expected when the lung-tissue round them has broken down, but this explanation cannot fit most of the recorded cases, in which the signs of phthisis were either absent entirely, or, if present, showed the disease to be in the chronic and not in the active stage. Against this theory is the fact that most of the calcified tubercular nodules found in the lung are really formed of fibrous tissue in intimate connection with the rest of the lung-tissue, and but rarely surrounded with a capsule from which they could be shelled out. Although the disintegration of old cretaceous masses may be held to account for some of the cases of expectoration of calcareous masses, still the majority are to be referred, there can be little doubt, I think, to the bronchial glands.

Calcareous glands are sometimes expectorated bodily, and the only difference between this group of cases and those under consideration is that the disintegration is fragmentary and the discharge piecemeal. For this view there is the most pathological support. Thus Fagge records a case in which a man had expectorated calcareous masses for some time at the rate of two or three a week, and after death a calcified gland was found lying in an abscess communicating with a bronchus. In all cases alike, whether the source is in the glands or elsewhere, the detachment must be brought about by a process of ulceration, and thus the expectoration of such masses will always be attended with risk, and it is often accompanied with more or less hæmorrhage. When it occurs in phthisis, it is another evidence of the activity of the disease, but in many instances it is unattended with symptoms of physical signs, and the patient may remain in good health and otherwise unaffected for many years.

The following is a list of cases I have come across, but it does not pretend to be complete:—

1. Bayle.[1]—Male, 59. Post-mortem calcified bronchial gland.

2. Portal.—A case in which 500 were brought up over a long period of time. In connection with this case may be mentioned that of Vaillant the botanist, recorded by Boerhaave,[2] who expectorated 400.

3. Hamilton.[3]—Female, 22. With much hæmoptysis and cough, the masses being mostly of small size, about that of a caraway-seed. The largest was an inch long and irregularly branched, and a drawing of it is given.

4. Hamilton.—Male. One mass twelve years before. Patient still well.

5. Hamilton.—Female, 17. Several with hæmoptysis. Pulmonary systems, but no signs of phthisis.

6. Guibert.[4]—Male, 34. Many attacks of inflammation of the lungs from the age of six years. One mass weighing 4.7 grammes. Patient died at the age of 34. No post-mortem.

7. Fredault.[5]—Male. Calcareous mass found in bronchus at junction of middle and lower lobes, weighing 139 grains.

8. Henocque and Leroy.[6]—Male, 21. Twelve calculi found in bronchus of right lower lobe, thought to be cartilages, and cartilage and bone demonstrated on section. Drawings given.

9. Peacock.[7]—Male. At 22 slight hæmoptysis. At 23 chalky concretion expectorated, weighing 30 grains, preceded by pain in the left hand and arm. At 26 and again at 28 similar attacks. A few yellow masses were also expectorated, which were thought to be caseous substance. No physical signs developed, and the patient was known to be well at the age of 30.

10. Walshe refers to cases, but describes none.

11. Burdel.[8]—Female, 57. Irregular cylindrical calcified mass the size of a bird's egg, thought to be calcified blood-clot dating from hæmoptysis 22 years previously.

12. Flint.[9]—Male, 42. A great many small masses. Patient in good health many years after.

13. Flint.[10]—Male, 23. A few small ones. Phthisis at the left apex.

14. Fagge.—Case already referred to.

15, 16. West.—Two cases—one in private, one at the Hospital—both in young men about 25 years of age. The first had brought up several small masses. The one which he showed me first was about $\frac{3}{4}$ inch long, like a piece of broken coral, about $\frac{1}{8}$ inch in diameter, and he stated that he had brought up several others at irregular intervals of weeks. He presented no definite physical signs in the chest, or any of the constitutional signs of advancing phthisis, but he had a troublesome cough at the time of expectorating these masses, which subsided after the expectoration of them.

The second case was similar, but the patient had signs of chronic phthisis in the right apex, and the masses were quite small, about the size usually of a barley-corn. They consisted chiefly of carbonate and phosphate of lime.

The subsequent course of these cases I do not know, for they both passed out of my observation, though they were both in *statu quo* some months after my first seeing them.

[1] Rech. s. la Path. Pulm., 286.
[2] Charcot: Traité de Médecine, p. 391.
[3] Dublin Hosp. Gaz., 1854, vol. i. p. 138.
[4] Gaz. d. Hôpit., 1865, No. 18.
[5] Gaz. d. Hôpit., 1866, No. 61.
[6] Gaz. Hebdom., 1868, vol. i. p. 146.
[7] Trans. Path. Soc. Lond., vol. vi. p. 75.
[8] L'Union Médic., 1876, 931.
[9] Phthisis, p. 156.
[10] Med., p. 963.

CASE OF HÆMORRHAGIC TYPHOID WITH RECOVERY.

BY

SAMUEL WEST, M.D.

In typhoid fever hæmorrhage from the bowels is a very common complication, and a risk to which every patient is exposed; hæmorrhage from the nose is frequent, to a slight extent, in early stages, and may be copious; and in the later stages of a bad case petechial spots appear sometimes upon the leg. Hæmorrhages other than these are very rare, and the hæmorrhagic form of typhoid, in the sense in which we speak of the hæmorrhagic form of any other specific fever, is the rarest of all.

The following is an instance of this rare condition, which is remarkable in another respect, inasmuch as the patient got quite well.

Julia L., aged 18, cardmaker, was admitted into the Hospital on October 31, complaining of pain in the abdomen, back, and neck, with a temperature of 103°, which rose shortly after to 105°.

The following history was obtained:—

The patient was in her usual health until two or three weeks ago, when she began to complain of gnawing pain in the loins, legs, and back of the neck. She was sick occasionally, and had almost constant headache, occasional shivering fits, lost her appetite, and was constipated, but she was able to keep at work until a few days ago. On October 24 she went to the Hospital and was given some medicine, but not improving, she saw a private doctor, who said she was suffering from rheumatism, and treated her accordingly. On October 31 she applied again to the Hospital, and was admitted with the diagnosis of typhoid fever.

Condition on Admission.—The patient was a slight, delicate-looking girl, evidently very ill. Her features were pinched and drawn, her complexion very pale, with a flush upon the cheeks,

her temperature 103°. On the abdomen were several rose spots. The tongue was moist, red at the edges, tip, and centre, and coated at the sides; the abdomen a little distended, but the spleen not enlarged; appetite bad and a good deal of nausea, with occasional sickness; pulse 132, of very low tension; respirations 32; some bronchitis, but no other signs of chest mischief.

The patient had retention of urine, and the water had to be drawn off with a catheter.

The chief complaint made by the patient was a feeling of illness, troublesome sickness, and pains and aching all over the body, especially in the shoulders, back, and hips.

November 1.—Temperature 105° last night, 102° this morning. Patient slept very badly, vomited several times in the early morning, and had a troublesome cough. She was given a draught of nitro-hydrochloric acid and strychnia, and put upon fluid diet with 2 oz. of brandy, subsequently increased to 6 oz.

The condition during the next three days was much the same. The patient vomited from time to time, slept very badly, had a good deal of abdominal pain, and the temperature was high.

On November 5 the lips and gums began to bleed, and there was some slight epistaxis; the urine also contained a slight trace of albumen; pulse 120, respirations 24.

November 6.—The urine contained a great quantity of blood, but no casts were found. Bleeding continued from the mouth and nose. The patient felt much worse to-day, and the abdominal pain was worse. The vomiting continued as before, but she complained more of pain, especially in the loins. The bowels were confined, and had not been open since admission. An injection of 10 minims of ergotine was given, and a few hours later one of 3 minims of strychnia on account of the alarming sickness

November 7.—The patient was very ill indeed last night, and seemed almost dying. She vomited several times, chiefly blood and mucus; slept on and off, and was not delirious. She had another injection of ergotine, 10 minims, followed by an injection of strychnia of 3 minims, and she was placed upon a mixture containing citrate of caffein 5 grains, liquor strychninæ 4 minims, every four hours.

In the early morning she became very cold and greatly collapsed, and seemed almost on the point of death. This morning the pulse was 132; respirations 32; the temperature 102°, having risen last night to 103°. There was a great deal of blood in the urine, several purpuric spots upon the abdomen, and some patches of subcutaneous hæmorrhage on the outer angles of the eyelid, and also beneath the conjunctivæ. She

looked extremely ill, and it seemed hardly possible that she could recover.

She was now given twenty drops of turpentine in some mucilage and water every four hours, and because the urine seemed a good deal diminished, some dry cups were applied over the loins, which of course resulted in extensive subcutaneous hæmorrhages.

November 8.—Patient seemed a little better. She slept about three hours; vomited three times, but no more blood. Another injection of 10 minims of ergotine was given during the night. The patient coughed up several clots of blood. The urine contained less blood this morning, but the lips and gums still continued to bleed, and there were some fresh purpuric spots on the abdomen, and a few also on the neck.

November 9.—Patient had a very bad night, vomiting almost incessantly for four hours, for which an injection of liquor morphinæ—3 minims—was given. She was delirious all night, and had several injections of ether and strychnia; but this morning she seems rather better, is quite sensible; there is less blood in the urine and less bleeding from the lips. The pulse is extremely feeble, 120, and the temperature nearly 104°. She took her food fairly well, as she had done from the beginning. The quantity of urine was about 30 oz., the daily average throughout.

November 10.—Patient had better sleep during the night, but was delirious when awake. She vomited once, and the vomit contained a little blood. The urine contained less blood. She was now placed again upon the citrate of caffeine and strychnia.

November 11.—Patient better, had not vomited any more, passed a fair amount of urine containing very much less blood, and the bleeding from the lips and gums had stopped.

November 12.—Patient much better, slept well; bowels relieved three times naturally, stools dark but free from blood; no vomiting for three days, and the urine now contained the merest trace of blood.

The blood was examined by Mr. Lloyd, and found to be in the condition characteristic of secondary anæmia. Red blood cells, 1,584,000 per cm.; hæmoglobin, 20 per cent.; no nucleated forms; cells well preserved in shape; only one or two poikilocytes seen. White cells, 5000 per cm. Lymphocytes, 27.5 per cent.; neutrophile, 52.1 per cent.; mononuclear, 18.3 per cent. No coarsely granular eosinophile cells seen in the specimens examined.

The patient continued to improve for the next few days.

On the 14th the urine was examined again. No trace of blood was present, but a small quantity of albumen; it deposited a copious sediment of mucus, in which were found a good many pus cells. The ecchymosis on the eyelids and conjunctivæ had almost gone. The bowels had been constipated throughout, requiring an enema every few days to get them to act, and the motion had never contained any trace of blood.

The character of the temperature is worthy of note. At first it averaged about 103°, with no wide daily range; when the hæmorrhage set in, although the average temperature was about the same, the daily oscillations became wider. When the patient began to improve subsequently, the temperature fell gradually with a gentle declination, until it reached the normal on the 18th November, about six weeks from the commencement of illness. The patient went on improving steadily. A tonic containing iron and nux vomica was given her on the 27th November, and some pudding and boiled bread, and a rather larger amount of milk were added to her diet. The next day the temperature rose, and she appeared to be not so well. Great alarm was felt lest a relapse was going to occur, but the temperature remained high for a couple of days only, though it reached 104°; convalescence was then continued without further interruption. The patient is now quite well.

The daily note sufficiently indicates the gravity of the case; for many days I felt that she had no chance of recovery, and I thought she might die at any moment. As regards the hæmorrhage, it is worthy of note that although she bled from the lips, gums, nose, air-passages, stomach, kidneys, and into the skin, still she never at any time passed blood by the bowel.

The case is altogether remarkable: first, on account of its rarity. Out of a very large number of cases of typhoid, numbered by hundreds, this I believe to be, as far as I can remember, the only case of the hæmorrhagic condition among them. It is also remarkable in respect of having made a good recovery, but I do not know whether the prognosis of the hæmorrhagic form of typhoid is better than that of the hæmorrhagic condition of other specific fevers.

How far the careful nursing and energetic treatment of the case is answerable for the favourable result it is hard to say, but certainly for many days it seemed impossible that the patient should live, and the slightest neglect or error in treatment might easily have produced a different result. Certainly the nurses, and especially my House-Physician, Mr. Butler, deserve that every credit should be given them for bringing the case to so happy a termination.

SOME INTERESTING CASES FROM THE SKIN DEPARTMENT.

BY

SAMUEL WEST, M.D.

I. *Case of Addison's Disease of five years' (at least) duration—Appearance of pigment spots and subsequent disappearance.*

Kate M., aged 46, a widow, was admitted in Elizabeth Ward on 18th January 1895. She came in on account of anæmia due to menorrhagia consequent on a fibroid tumour of the uterus. She presented all the ordinary signs of anæmia. The heart was dilated, with a general hæmic murmur. She looked pale, but there was nothing much beyond that. Her skin was somewhat sallow, and could be almost described as bronzed.

The point of interest about the case is that she was an in-patient in the Hospital in June 1891 with the same bronzed sallow condition of the skin, and the diagnosis then was made of Addison's disease. The notes show that there were then several spots of pigment, dark in colour, like moles, but not raised, upon the upper part of the chest and arms. Some were the size of a pea, the largest about the size of a threepenny-piece. Now none are present; they have in the interval between her two admissions entirely disappeared, though her general condition is much as before.

If this be a case of Addison's disease. as it appears to be, the presence of the spots of pigmentation on parts of the skin which are already bronzed is interesting, though of course not very unusual; and their complete spontaneous disappearance, with the persistence of general bronzing and other symptoms of Addison's disease, is remarkable.

II. *Case of Scleroderma, with acute onset, and interval of partial (? complete) resolution.*

Annie C., a married woman, of the age of 27, came to the Hospital complaining of an eruption upon the side of her

face. All her functions seemed to be normal. She appeared to be a healthy woman, and made no complaint of anything except the condition of the skin upon her face.

The back part of the cheek on both sides looked swollen, and the affected parts were somewhat pink in colour. Scattered over them, especially on the left side, were many purplish, dark-coloured lumps resembling at a distance somewhat spots of indolent acne, and even somewhat resembling a tertiary syphilitic nodule. The rash occupied the posterior part of each cheek, extending on both sides somewhat behind the ramus of the jaw, and advancing on the left side to the level of the malar bone, though not extending quite so far upon the right side. To the touch the whole of the affected portion of the skin was stiffened, and felt like scleroderma. The seat of this stiffening was evidently in the deeper tissues—the epidermic structures, the hair and the sweat glands being unaffected. The lumps were raised above the surface, and were solid, not soft; and on examining the patches with the finger, many other lumps were detected which were not obvious from their colour to the eye.

This was especially the case on the right side of the face, where the disease was now not so extended. The eruption began, the patient said, on this side—the right—and there had been as many lumps on that side as there were on the opposite one, but the lumps had now gradually disappeared. The rash on the left side of the face had begun a little later, and was still extending. There was a little warmth, but no great heat of the skin, no tenderness, no anæsthesia, and no subjective sensations of any kind.

The patient was under treatment with a similar attack last year. It then affected the right side of the face. The diagnosis then made was scleroderma. She was placed upon iodide of potassium, and a very rapid improvement took place on it in the course of a fortnight. It appeared that she did not long continue to take the medicine, and ceased to attend, the rash having greatly improved, and, as far as I could learn, she believed it to have quite disappeared. It is only during the last two or three weeks that the disease has returned. It began on both sides, affecting the right first, where it is now resolving, according to her statement, attacking the left side next, on which side it has extended much farther than on the right, and is at the present moment getting worse, although she states that there were many more of the livid, purple lumps on that side a little while ago than there are now, but these lumps, she states, are disappearing.

She is a married woman. She has one child, has had no

miscarriages, gives no history of any affection which would indicate syphilis, and shows no sign of syphilis.

It appears to be a case of acute scleroderma, but the livid lumps are peculiar, and the effect of iodide of potassium is to be noticed.

III. *Two Cases of Hebra's Prurigo.*

1. A Jewish boy, aged 10.

The eruption was first noticed soon after birth; it was distributed all over the body, limbs, and face. When two years old he was treated at the German Hospital, and subsequently at the London Hospital, but in both cases without benefit. The rash is usually better in the summer, but has never entirely disappeared, and during the last year it has, on the whole, been somewhat less extensive.

The eruption is distributed in small patches—groups of papules—all over the body and limbs, but slightly more uniformly on the face than elsewhere. On the body it is more extensive on the upper part of the chest and just above the buttocks, but the upper parts of the thigh are nearly clear, while the eruption becomes very thick below the upper third of the thighs. The grouping of the papules into patches is not obvious until it is looked for. Each patch consists of from about 30 to 60 spots; they are bright in colour, and most of the tops have been scratched off. The rash seldom itches, except at night, when the patient gets in bed. None of his brothers or sisters are affected in a similar manner, and no cause can be assigned for his disease.

At first sight the case looked very much as if it were one of aggravated itch; but the distribution was wrong; the quantity of rash on the face, and the absence of it about the thighs, was distinctive. Although there could be no doubt about the nature of the case, I placed the patient upon treatment with sulphur ointment and baths, giving him three or four baths a week, and rubbing him almost every night and morning with some sulphur ointment where the patches were worst. This produced, in the course of a few weeks, considerable amelioration, and the patient stated, and his mother stated, that he was better than he had ever been before. However, as soon as the treatment was given up, the eruption became just as it was before the treatment, and although the use of sulphur ointment relieved him from time to time, it had no permanent effect upon the disease.

The patient has been under observation now for two or three years, and is not changed.

2. The second case is in a boy of four years of age, who was well until he was three months old, when some large brown scales appeared over the forehead and head, but these were treated and soon disappeared. Very shortly after this, small papules made their appearance on the body, and thence spread to the limbs and to the face, causing a great deal of irritation, which, though better and worse, has never entirely gone. The whole body now, more or less, is covered with small papules, the tops of which have been scratched off, and the disease is evidently one of Hebra's Prurigo.

Except for this eruption, the patient has always been quite healthy: the mother has several other children, all well, and has never had any miscarriages.

Treatment also in this case had no material effect.

IV. *Multiple Indolent Gummata.*

A man of six-and-twenty years of age had a chancre five years ago, but has had no special symptoms since. He always has been, and is at the present time in good health. He came to the Hospital for several lumps in the skin, which were tender when they were touched or pressed upon, but were not otherwise uncomfortable. The patient had slight enlargement of the lymphatic glands at the back of the neck, above the elbow, and also in the groin, but these were chronic, and probably of long standing.

There were no recent signs of syphilis, except the lumps in the skin. These lumps existed, one, about the size of a cherry, over the left breast, another on the outer surface of the right thigh, the third on the inside of the left thigh, and one in the right scapular region of the back. They all felt like small fibrous tumours, being seated in the subcutaneous tissue. The skin was adherent to them, but they were movable on the parts beneath. They were a little tender when pinched, but not otherwise painful. There was no redness over the skin, nor were there any indications of their breaking down. Their nature, however, was thought to be syphilitic, and the patient was placed upon iodide of potassium. Within a very short time complete resolution of the tumours took place, and they disappeared without leaving any traces.

PROCEEDINGS

OF

THE ABERNETHIAN SOCIETY

FOR THE SESSION 1894–95.

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Treasurer . . .	Mr. Alfred Willett, F.R.C.S.
Secretaries . . .	Mr. F. A. Smith, Mr. A. Pain, Mr. A. Barron.
Additional Committee-men	Mr. H. D. Everington, Mr. R. H. Bremridge.

June 31.

The Midsummer Meeting was held, Mr. Maidlow in the chair.

Mr. Willett read a paper on 'The Life Work of Mr. Stanley,' a former surgeon to this Hospital.

A vote of thanks was proposed by Dr. Shore, and seconded by Mr. Paterson.

October 11.

The Introductory Address was delivered by Sir James Paget to a large audience, including many visitors from the learned societies of other Hospitals, on 'Scientific Study in the Practice of Medicine and Surgery.'

Mr. Marsh proposed a vote of thanks, which was seconded by Mr. Bowlby and carried with acclamation.

October 18.

The first ordinary meeting was held, Mr. Maidlow in the chair. The Rev. George Henslow read his paper on 'Dietetic Value of Food Stuffs Prepared by Plants.' In the course of his paper the Rev. George Henslow showed the different food values of vegetable foods, criticising adversely the value of potato food. The Irish navvy, when he first came to England, could not compare with the English navvy until he had adopted the food of his English comrade.

October 25.

Second ordinary meeting was held, Mr. Cross in the chair.

Cases of (i.) athetosis and (ii.) scleroderma were shown. Dr. Tooth then read a paper on 'Functional and Hysterical Disorders.' Disorders of (i.) movement, (ii.) sensation, (iii.) special senses in relation to hysteria, were described, and their special diagnostic features. It was pointed out that the children of hysterical patients ought to be sent away from home.

November 1.

The third ordinary meeting of the Society was held, Mr. Maidlow in the chair.

Dr. Horne showed a case of tubercular ulceration of the soft palate.

Dr. Lewis Jones read his paper on 'Paralysis of the Upper Arm.' The paper was illustrated by slides.

November 8.

The fourth ordinary meeting of the Society was held, Mr. Maidlow being in the chair.

Mr. Paterson showed a case of skin-grafting by Thiersch's method.

Dr. Griffith read his paper on 'Common Difficulties of Lactation.' The time at which baby should be put to breast after delivery was discussed. The best method of suckling was explained. There was no such thing as milk-fever. The temperature does not rise except from pathological causes. Other parts of the paper dealt with mammary abscess and the quantity of milk secreted.

November 16

The fifth ordinary meeting of the Society was held, Mr. Cross in the chair.

Mr. Maidlow showed an egg, the shell of which presented marked longitudinal ridges.

Mr. Gill then read his paper on 'The Measure of Anæsthesia.' It was pointed out that the pupil was the best sign to watch. Normally this should be contracted under the influence of chloroform. If atropine had been used for the eye, this sign was useless.

November 22.

The sixth ordinary meeting of the Society was held, Mr Maidlow in the chair.

Mr. Maxwell showed a case of obstruction of the right iliac vein.

Dr. Herringham read his paper on 'Disorders of Movement.' Disorders of gait were analysed into (i.) loss of power of balance; (ii.) loss of power of legs. The gait of diphtheritic paralysis, alcohol-disseminated sclerosis, and tabes dorsalis were described. Tremors and chorea formed the subject of the latter part of the paper.

November 29.

The seventh ordinary meeting of the Society was held, Mr. Cross being in the chair.

Mr. Collyer showed two cases of frostbite occurring in two boys who were twins.

Dr. Collins read his paper on 'The Pathology of Insanity.' The action of the County Council in this matter was described. Among the more tangible results, a pathologist to the London pauper asylums had been appointed, and a laboratory at the Claybury Asylum instituted. Incidentally, Dr. Collins called attention to Hogarth's picture, 'The Rake's Progress,' in which almost every form of insanity is depicted, and the scene laid in Bethlehem Hospital.

A good discussion followed.

December 6.

The eighth ordinary meeting of the Society was held, Mr. Maidlow being in the chair.

Dr. Roberts read a paper on 'Common Causes of White Leg.' This paper contained many original observations and led to a lively discussion, in which Dr. Champneys took a part.

December 13.

The ninth ordinary meeting of the Society was held, Mr. Cross being in the chair.

Mr. Berry read a paper on 'Fracture of Patella,' and his paper, which was very exhaustive, has been published in the Hospital Journal.

January 10.

Dr. Lauder Brunton delivered the Mid-Sessional Address on 'Little Things,' Mr. Maidlow in the chair.

January 17.

The tenth ordinary meeting of the Society was held, Mr. Cross being in the chair.

Mr. Colby showed a case of scleroderma.

Mr. Eccles read a paper on 'The Mechanical Treatment of Hernia.' Many cases of hernia were shown in illustration of the paper, which dealt with trusses, and did not touch the subject of 'radical cure.'

January 24.

The eleventh ordinary meeting of the Society was held, the Vice-President, Mr. H. B. Meakin, in the chair.

Dr. Hamer read a paper on 'Mortality in Unhealthy Areas of Towns.' The relation of filth to disease and mortality, and the chief hygienic improvements, formed the subject of the paper.

January 31.

The twelfth ordinary meeting of the Society was held, the Vice-President, Mr. H. B. Meakin, in the chair.

Mr. Bailey read a paper on 'Enterotomy.' The history of intestinal surgery, the details of the operation of enterotomy, and a strict definition of the term 'enterotomy,' were the main divisions of the paper.

February 7.

The thirteenth ordinary meeting of the Society was held, Mr. E. W. Cross in the chair.

Mr. Paterson read his paper on 'Some Medical and Surgical Aspects of Dental Caries.' The causes of decay were enumerated, and the complications arising out of such decay. The importance of hygienic measures in preserving the teeth was commented on, and the assiduous use of the tooth-brush strongly advised.

February 14.

The fourteenth ordinary meeting of the Society was held, the President, Mr. Maidlow, in the chair.

Mr. Maxwell exhibited a case of multiple mollusca fibrosa.

Dr. Kanthack read a paper on 'Tetanus and what it Teaches.'

This paper has been printed in book form by the Society.

February 21.

The fifteenth ordinary meeting of the Society was held, the Vice-President, Mr. Sloane, in the chair.

Mr. Keown showed a case of congenital flexion of both elbow joints.

Dr. Morrison showed a case of chancre of the eyelid.

Mr. Maxwell showed a case of possible locomotor ataxia.

Dr. Atlee showed a case of xanthoma plaucim of both upper eyelids in a woman aged forty-eight.

Mr. Maidlow was then called upon to read his paper on 'Biblical Syphilis.' A lively discussion followed.

February 25.

The sixteenth ordinary meeting of the Society was held, Mr. Maidlow, President, in the chair.

Mr. Maxwell showed a case of general dermatitis.

Dr. Chattaway read a paper on 'Diffusion.' Gaseous diffusion was first treated, as being the most simple; then liquid diffusion. The practical applications of liquid diffusion were pointed out, and some concluding remarks were devoted to demotic pressure.

March 13.

The seventeenth ordinary meeting of the Society was held, the President, Mr. E. W. Cross, in the chair.

A clinical evening was the business. Cases of (i.) ulceration of the scrotum; (ii.) rodent ulcer; (iii.) acromegaly; (iv.) epispadias; (v.) microscopical sections of an ossifying spindle-celled sarcoma; (vi.) real lengthening of the tibia after tubercular disease of the upper epiphysis; (vii.) baby with lateral movements of the head and mystagmus; (viii.) a bag invented by Dr. Champneys for dilating the os and inducing labour; and (ix.) the notes of a complicated case from Martha were read.

March 20.

The eighteenth ordinary meeting of the Society was held, Mr. Maidlow in the chair.

Mr. Jessop read a paper on his experiences while in the dissecting-rooms—a space of thirteen years.

May 1.

The conversazione of the Society in commemoration of the centenary of the Society's foundation was held.

LIST OF OFFICERS

FOR THE SESSION 1895–1896.

Presidents—Mr. H. B. Meakin and Mr. J. K. Murphy.
Vice-Presidents—Mr. F. A. Smith and Mr. S. Gillies.
Treasurer—Mr. Alfred Willett.
Hon. Secretaries—Mr. R. H. Bremridge and Mr. W. R. Stowe.
Additional Committee-men—Mr. A. L. Ormerod and Mr. J. A. Willett.

DESCRIPTIVE LIST

OF

SPECIMENS ADDED TO THE MUSEUM

DURING THE YEAR 1895.

SPECIMENS ADDED TO THE MUSEUM

During the Year ending September 30, 1895.

DESCRIBED BY

A. A. KANTHACK.

SERIES I.

DISEASES OF BONE.

RICKETS.

270a. This specimen, which includes the whole of one side of the Thorax, has been so prepared as to show the Ribs and their Cartilages on section. In this manner the beading at the costo-chondral articulations is well seen, both in section and, on turning the specimen round, also in relief. The changes in the curves of the ribs and in the position of the sternum are also evident: the ribs are less curved than normally and the sternum is pushed forward out of position.

The specimen was obtained from a child aged 2½ years.

See *Male Surgical Register*, vol. v. (1894), No. 2804; and *Surgical Post-Mortem Register*, (1894) p. 155.

SARCOMA.

453b. A vertical section through the bones of a Knee-Joint, removed by operation from a woman aged 20, who came under observation for a brawny swelling in front of the knee, which was regarded to be chronic inflammation of the bursa patellæ. The patella is uniformly and symmetrically enlarged, and its bony structure has disappeared. Microscopically the growth is a giant-celled (so-called myeloid) sarcoma.

Half the specimen is preserved in the Royal College of Surgeons' Museum, No. 1637a.

See *Transactions of the Pathological Society* (1894–95).

Presented by Robert Jones, Esq., F.R.C.S.

SERIES II.

DISEASES OF JOINTS.

TUBERCULAR NECROSIS OF ARTICULAR BONE.

572a. Lower end of the Femur showing tubercular necrosis in its most typical form. There are two symmetrically situated wedge-shaped sequestra, one in each condyle, the bases of the necrosed wedges corresponding to the articular surfaces. There is no bony thickening or sclerosis around the sequestra, and the outline of the bone is not altered, but preserved, and the sequestra are firmly fixed in the surrounding osseous tissue. The condyles have been removed by operation on account of tubercular disease.

See *Bowlby's Surgical Pathology*, (1895), pp. 392, 394; and *Male Surgical Register*, vol. iv. (1894), No. 1517.

ACUTE ARTHRITIS OF INFANTS.

621d. A Hip-Joint of an infant aged 5 months, laid open by a vertical cut to show the interior of the joint. The head of the femur is greatly diseased and in part destroyed, and the cavity of the joint was filled with pus. The neck and shaft of the bone are also considerably affected, the former being carious and the latter acutely inflamed, the marrow being red and thick (osteo-myelitis).

See *Male Surgical Register*, vol. iv. (1894), No. 3815*; and *Surgical Post-Mortem Register*, (1894), p. 13.

SERIES III.

INJURIES OF BONE (FRACTURES).

SUBCRANIAL HÆMORRHAGE.

881b. The Skull has been fractured, the bones are broken in various directions, and the fragments are depressed. A large clot is seen between the calvaria and the dura mater, extending towards the middle line as far as the falx cerebri and downwards towards the base. The clot has pressed on the brain and pushed it away, causing considerable displacement. The injury was caused by a fall on the head, which produced death in a few hours.

See *Surgical Post-Mortem Register*, (1894), p. 72.

UNION BY WIRING.

988b. The Patella was obtained from the Dissecting-room. There has been a transverse fracture across the whole breadth of the patella, which was kept together by silver wire, as shown in the specimen; the line of union can yet be seen, and union is complete. The knee-joint was anchylosed.

SEPARATION OF THE EPIPHYSIS.

990b. The upper part of a Tibia which has been divided by a sagittal section. The specimen shows marked displacement forward of the epiphysis. Union, however, fibrous in nature, was extremely firm.

The leg was removed by operation from a boy aged 16, who was admitted on account of an accident which befell him (being caught by a machine); gangrene of the leg followed, and the leg was amputated thirty-six days after the injury.

See *Male Surgical Register*, vol. iii. (1895), No. 1045*.

SERIES X.

DISEASES AND INJURIES OF THE LARYNX AND TRACHEA.

SYPHILITIC DISEASE.

1627a. The entire Mucous Membrane of the Larynx is thickened, warty or nodular, and hyperplastic, and, as seen on microscopical examination, is in the condition described by Virchow as "diffuse pachydermia." The vocal cords have been destroyed and are overgrown by the hyperplastic epidermal tissue. The mucosa in the subglottic region is also greatly affected, thickened and roughened, showing erosions and ulceration here and there. The epiglottis has disappeared, and in its place are found a few tags. The mucous membrane at the base of the tongue is also greatly hypertrophied, and is papillomatous in appearance.

The condition is probably due to syphilis, though a distinct history was not obtainable; malignant disease was excluded by a histological examination.

See *Proceedings of Laryngological Society*, 1894, May 8th.

Presented by F. G. Engelbach, Esq.

FOREIGN BODIES.

1661a. Two small pieces of Bone are impacted in the Larynx of a child aged 7 months. They have been coloured with carmine in order to set them off against the mucous membrane. There is extensive ulceration of the mucosa around and below the bits of bone. Laryngotomy has been performed to relieve the dyspnœa, and the artificial opening is seen below the ulcerated area, but the child died from bronchopneumonia.

See *Male Surgical Register*, vol. iii. (1894), No. 3943*; and *Surgical Post-Mortem Register*, (1894), p. 35.

SERIES XI.

DISEASES AND INJURIES OF THE PLEURA, BRONCHIAL TUBES, AND LUNGS.

SECONDARY DEPOSITS IN PLEURA.

1678a. The surface of the Pulmonary Pleura shows numerous closely packed white irregular nodules. These are formed by the blocked lym-

phatics of the pleura. The blocking is due to cancerous dissemination from the breast along the lymph channels. The breast microscopically was shown to be affected with scirrhus; the axillary glands also were hard and enlarged, and contained secondary growths. The parenchyma or alveolar substance of the lung was free from metastatic deposits.

See *Female Surgical Register*, vol. iii. (1893), No. 842; and *Surgical Post-Mortem Register*, (1893), p. 89.

BRONCHO-PNEUMONIA.

1690a. Right Lung of a child aged 18 months, showing marked broncho-pneumonia and emphysema. The distended air vesicles are best seen along the posterior surface and anteriorly near the inner margin. The emphysematous distension is partial and localised in its distribution, and does not affect the lung generally, as is the case in ordinary "hypertrophic" emphysema. There are some depressed areas on the surface of the lung, corresponding to airless patches in the substance of the lung. (See the next specimen, No. 1690b, where a section of the opposite lung is shown.)

1690b. Section through Left Lung of the same case from which the preceding specimen was obtained. The cut surface of the lung is riddled with numerous holes and cavities, irregular in size and shape, some being round, others more or less cylindrical, or even varicose. The intervening lung substance is consolidated, in a condition of broncho-pneumonia. The cavities are apparently distended and dilated bronchioles, *i.e.*, multiple bronchiectases; this can be well seen in some parts of the section, where longer portions of the bronchioles have been preserved. The process has affected also the smallest bronchioles, and near the surface the air vesicles in communication with such bronchioles have been greatly distended, so as to be almost translucent.

A section through the whole lung, mounted between glass, has been preserved. (See Series lv. No. 151b.)

See *Mary Ward Book*, (1894), No. 142; and *Medical Post-Mortem Reports*, vol. xxi. p. 248.

GANGRENE.

1709a. The section of Lung shows a necrotic gangrenous mass immediately under the Pleura. It will be seen that there is an infarct, still fairly clearly marked off from the rest of the lung tissue, but extremely well differentiated by its darker colour when the specimen was fresh. At its apical end this infarct has sloughed, and thus led to the necrotic area mentioned. There is also well-marked bronchiectasis and pleurisy.

See *Medical Post-Mortem Register*, vol. xxi. p. 49.

PHTHISIS.

1725a. The specimen shows a round cavity at the apex of the Lung, with a smooth wall, covered by fibrin. The hollow of the cavity is occupied by a round ball-like clot, consisting of coagulated blood, and forming a cast of the cavity. The pleura covering this portion of the lung is

considerably thickened. There was also a ruptured aneurysm of the pulmonary artery, to which the clot owed its origin, and tubercle of both lungs.

For drawing of the specimen while fresh, see Series lvii. No. 268a.

See *Mark Ward Book* for 1894, *sub* James Fantley; and also *Medical Post-Mortem Register*, vol. xxi. p. 25.

TUBERCULAR DISEASE OF THE PLEURA AND MEDIASTINUM.

1727c. Left half of the Thorax of a child aged 14 months, showing numerous irregular nodular tumours under the costal pleura, which were tubercular in nature. They are best marked posteriorly along the vertebral column, and also along some of the ribs, and in the intercostal spaces. The outer surface is free from tubercle.

There were extensive pleuritic adhesions; tubercle was found in the right lung, the bronchial and cervical glands, and in the thyroid gland, and the lung was universally adherent.

See *Male Surgical Register*, vol. v. (1893), Nos. 1971 and 2126; and *Surgical Post-Mortem Register*, (1893), p. 149.

CAST FROM PULMONARY ARTERY.

1752a. The clot was pulled out of the Pulmonary Artery of a woman who died of septicæmia. It was firm and dark, but it is doubtful whether it is more than an intra-vitam or post-mortem clot, similar to those frequently found in persons dead of pneumonia.

See *Surgical Post-Mortem Register*, (1893), p. 80; and *Female Surgical Register*, vol. v. (1893), No. 787.

SERIES XII.

DISEASES OF THE MOUTH, TONGUE, PALATE, AND FAUCES.

PERFORATION OF THE SEPTUM NASI.

1763a. A large oval hole is seen in the Cartilaginous Portion of the Septum. The bony portion is not affected. The specimen was removed from a man aged 80, who died of carcinoma of the rectum. There was no history of syphilis, and the bone being unaffected, it is probable that the lesion was not syphilitic. The cause of the defect is obscure, as no history of chromic acid poisoning, &c., could be obtained. The origin, therefore, is presumably a simple ulceration.

See *Male Surgical Register*, vol. iii. (1894), No. 98; and *Surgical Post-Mortem Register*, (1894), p. 6.

See *Proceedings of Laryngological Society*, 1895, Feb. 13.

EMPYEMA OF ANTRUM.

1774a. The Antrum Highmori has been laid open. The lining membrane of the cavity is greatly thickened, the opening into the middle meatus of the nose is widely dilated, and the mucous membrane of the middle meatus greatly thickened. The antrum contained a fair amount of pus, which has been washed out. The superior maxilla had to be removed

in order to make a polypoid growth, filling up the nasal cavity and the naso-pharynx, accessible to the knife. This growth was extremely vascular, and the patient's life had been endangered through repeated hæmorrhages. Microscopically this growth consisted of a fibrous stroma intersected by innumerable vascular spaces and capillaries. The patient's age was 21.

See *Male Surgical Register*, vol. iv. (1894), No. 722.

PAPILLOMA OF UVULA.

1803b. A warty Papillomatous Growth occupying and developed from the tip of the uvula of a woman; it was removed by operation.

ADENOID VEGETATIONS.

1806c. The posterior wall of the Pharynx and Naso-Pharynx has been divided in the median line. The hypertrophied adenoid tissue is seen on either side of the stretched velum palati. The posterior nares were completely obstructed. Looking into the buccal cavity from behind, the enlarged tonsils are noticed. The lymphatic follicles at the root of the tongue are also hypertrophied (lingual tonsil).

See *Surgical Post-Mortem Register*, (1894), p. 72.

SARCOMA OF TONSIL.

1807c. The Tonsil is uniformly enlarged by a growth which is seen to infiltrate the muscles. The specimen was removed by operation, and microscopically was found to be a round-celled sarcoma.

See *Female Surgical Register*, vol. v. (1894), No. 786.

SERIES XIII.

DISEASES OF THE TEETH.

DILACERATED TOOTH.

1819a. An Upper Central Incisor, showing dilaceration apparently due to violence during its development. There was also displacement of the cement-forming organ. This tooth had erupted in this dilacerated condition without causing deformity until the lateral incisor also appeared.

Presented by Lloyd Lewan, Esq.

SERIES XIV.

DISEASES OF THE SALIVARY GLANDS.

PAROTID CYST?.

1832c. A large Cystic Tumour removed by operation from a man aged 48. The cyst grew below the angle of the lower jaw, and there was no increase or decrease in the flow of saliva. The solid mass to which the cyst is attached shows lymphoid, but no salivary tissue.

See *Male Surgical Register*, vol. ii. (1894), No. 669.

SERIES XV.

DISEASES AND INJURIES OF THE PHARYNX AND ŒSOPHAGUS.

ŒSOPHAGEAL WARTS.

1857a. On the Mucous Membrane, which is somewhat thickened, numerous small nodules are seen, which on microscopical examination were found to consist of thickened epithelium and hypertrophied mucous membrane, the submucosa not being involved.

From a case of colloid carcinoma of the stomach, with secondary growths in the peritoneum.

A microscopical section is preserved in Series lv. No. 241a.

The stomach has been preserved in Series xvii. No. 1935a.

See *Medical Post-Mortem Register*, vol. xx. p. 244.

SERIES XVI.

DISEASES OF THE PERITONEUM, OMENTUM, AND MESENTERY.

TUMOUR ON MESENTERY.

1885b. On the Mesentery, near its posterior or dorsal attachment, a solitary small pedunculated growth was found, which was hard, and on cutting into, it contained hard gritty matter. On microscopic examination this was found to consist of a dense fibrous stroma containing numerous calcareous or earthy bodies, most of which presented a concentric structure. The bodies closely resembled the characteristic psammomatous bodies found in connection with the pineal body, the choroid plexuses, and the dura mater, if they be not identical with them.

The specimen was removed from a gentleman in whom post-mortem a large sloughing abscess of the colon and the surrounding tissues was found, which apparently had been caused by a foreign body (a bristle) impacted in the coats of the gut.

A microscopic specimen has been preserved in Series lv. No. 243.

Presented by J. Langton, Esq.

1885c. Two firm Growths, which were obtained after death from the body of a man who died with an enlarged prostate. The upper flat button-like growth is fixed by a short stout pedicle to the serous surface of the stomach, while the lower specimen is fixed by a similar pedicle to the serous surface of the cæcum. Microscopically these two growths consist of hard fibrous tissue containing some calcareous spicules.

See *Male Surgical Register*, vol. iii. (1893), No. 678; and *Surgical Post-Mortem Register*, (1893), p. 92.

CYSTS IN MESENTERY.

1885d. These peculiar Cystic Growths were obtained from the body of a woman who died of carcinoma of the rectum. Their walls are extremely thin, and before preservation they were pellucid and very delicate. Their nature is not known ; they are obviously not hydatid.

See *Female Surgical Register*, vol. i. (1893), No. 714 ; and *Surgical Post-Mortem Register*, (1893), p. 71.

MELANOTIC SARCOMA.

1886e. A portion of the Sigmoid Mesocolon studded with melanotic deposits, sarcomatous in nature, secondary to a growth in the rectum. There were also melanotic deposits in the liver.

Both the rectum and a portion of the liver have been preserved. See Series xix. No. 2073c, and Series xxi. No. 2215a.

Presented by H. J. Waring, Esq.

SERIES XVII.

DISEASES AND INJURIES OF THE STOMACH.

GASTRIC ULCER.

1918a-1. The Stomach has been laid open, and shows on the inner surface of the anterior wall a rugose ridge. This corresponds to a suture on the outer surface, which was performed to close the perforation of a gastric ulcer. The patient, an unmarried lady aged 33, suffered for about four weeks from slight pain after food and dyspepsia, unaccompanied by vomiting and hæmatemesis. She was suddenly seized by what was recognised as the signs and symptoms of perforation ; the abdomen was opened four hours later, and a small perforated ulcer was found on the anterior wall of the stomach. This was quickly closed by sutures through the peritoneal and muscular coats. She lived for three days after the operation. On examination after death the perforation was seen to be closed ; a very small amount of lymph was the only sign of peritonitis.

See *Female Surgical Register*, vol. ii. (1895), No. 245.

COLLOID CANCER.

1935a. The Stomach has been laid open, and shows an extensive Colloidal Growth, occupying the pyloric region, and extending thence for some distance along the upper and lower curvatures, and also slightly into the duodenum. The infiltration of the various gastric coats is well seen. There is no dilatation of the stomach, although the pyloric opening is constricted. The growth has worked its way through the serous coat of the stomach, and numerous colloidal deposits are seen on the peritoneal surface, one mass especially being of considerable size. These peritoneal deposits are arranged and grouped in a striking manner, recalling the structure of a "hydatiform mole."

The œsophagus of the same case has been preserved in Series xv. No. 1857a.

See *Medical Post-Mortem Register*, vol. xx. p. 244 ; and *Hope Ward Book*, (1893), *sub* Matilda Parker.

GASTRO-JEJUNOSTOMY.

1951c. The Stomach and adjoining parts of Intestines obtained from a woman aged 37. Six days before death a gastro-jejunostomy was performed on account of malignant stricture of the pylorus. The stomach has been laid open from behind at the pyloric end to show the cancerous growth and the obstruction caused by the same, and the communication into the jejunum on the anterior surface of the stomach; a blue glass rod has been passed through this opening into the jejunum. Senn's plates were used, but they were dissolved before death, and the silk ligatures by means of which they had been fixed alone are left. A small window has also been cut into the jejunum anteriorly, to show the opening into the stomach as indicated by the blue glass rod. It will be seen that in drawing up the duodenum and jejunum, in order to fix the latter up against the stomach, the large intestine has been caught in the loop, and also that the jejunum is greatly kinked. The various parts have been labelled in order to make identification easier.

See *Female Surgical Register*, vol. v. (1894), No. 2025.

SERIES XVIII.

DISEASES AND INJURIES OF THE INTESTINES.

FÆCAL FISTULA.

1958a. The preparation shows a small loop of Small Intestine attached to the skin of the abdomen by cicatricial and fibrous tissue. Two openings are seen in the small piece of skin, which are connected by a thin scar. These openings lead directly into the hollow of the gut. The parts were removed by operation from a woman aged 35.

Short History:—In March 1894 an abdominal hysterectomy was performed for uterine fibroids, and about three weeks later symptoms of intestinal obstruction appeared, and the abdomen was opened once again. The small intestine was then found to be adherent to the former wound. A fæcal fistula was established and now hardly any fæces were passed per anum, but there was an abundant discharge from the fistula, liquid and yellow, devoid of fæcal odour. Towards the end of May a futile attempt was made to close the fistula by a plastic operation, and a second operation, undertaken for the same purpose, a month later, also turned out a failure. Hence in July the abdomen was opened once more, eleven inches of small intestine were resected and removed, together with the fistulous openings, the neighbouring skin and scar tissue, and the ends of the gut reunited according to Maunsel's method. Though collapsed for two days after the operation, the patient made a splendid recovery. The bowels acted naturally three days after the operation.

See *Female Surgical Register*, vol. ii. (1894), No. 477; and also *British Medical Journal*, 1894, vol. ii. p. 1103.

1958b. A curiously distorted piece of Small Intestine (jejunum), which was resected from a young woman aged 22 on account of a fæcal fistula of fourteen years' standing, the result of perityphlitis. The upper part of

the loop (the inlet) is greatly distended and its muscular coat markedly hypertrophied. It forms a saccular cavity, which is shut off from the rest of the bowel except by a small opening which communicates with that dilated portion of the bowel which is immediately below the saccular cavity. This cavity had another opening, a fistulous aperture, which communicated with the surface of the body. The lower distended limb of this distorted S-shaped loop of intestine shows a large oval opening, the chief orifice of the fistula, and communicates with the upper diverticulum by means of the small opening already described.

The patient died a few hours after the resection. The united gut has been preserved in this Series, No. 2040q.

See *Female Surgical Register*, vol. ii. (1895), No. 429.

ENTERIC FEVER.

1990b. A Piece of Small Intestine showing (*a*) three Peyer's patches in a swollen condition; sloughing has not yet begun; (*b*) several small ulcers, which in position correspond to the simple follicles; (*c*) a perforated ulcer. Hence in a narrow compass three different stages of the enteric process are found co-existing. The patient had died of perforation and peritonitis.

At the autopsy the muscular and peritoneal coats were seen to be split as shown in the specimen, and the gut was greatly distended by gas. The condition may have been, however, a post-mortem rather than intra-vitam change, especially since there is no sign of necrosis or inflammation of the ruptured coats.

See *Matthew Ward Notes*, (1895), *sub* Walter H. Hardy; and *Medical Post-Mortem Register*, vol. xxii. p. 18.

TUBERCULAR ULCERATION.

2012a. The Ulcers occupy the position of Peyer's patches, and are arranged in the long axis of the gut, instead of in the transverse axis, as is usually the case. The edges are thickened, and there is an extensive inflammatory area around the ulcer, the floor of which is uneven and tuberculous. The tubercular nature of the ulcer is readily recognised on examining the peritoneal surface of the bowel, which shows numerous tubercles, especially over the area corresponding to the ulcers.

See *Medical Post-Mortem Register*, vol. xxii. (1895), p. 46.

2012b. The specimen shows a very early stage of a common form of tubercular infiltration and ulceration of the intestine. Above a small swollen follicular gland is seen, with a slight breach on its surface, while the Peyer's patch below shows typical tubercular infiltration at its upper end and commencing ulceration.

MALIGNANT DISEASE.

2027h. A piece of the Descending Colon occupied by a carcinomatous growth, which, extending from the surface, infiltrates and passes through the muscular and serous coats, and causes a serious stricture of the bowel. This during life led to intestinal obstruction, and on this account 13

inches of gut were resected, and the bowel reunited according to Murphy's method. The patient, a woman aged 65, died soon after the operation.

The intestine, with Murphy's button in position, has been preserved in this Series, No. 2040r.

Microscopically the growth is a typical columnar-celled carcinoma.

See *Female Surgical Register*, vol. ii. (1895), No. 1019; and *Surgical Post-Mortem Book*, (1895), p. 120.

FOREIGN BODY IN VERMIFORM APPENDIX.

2032e. A Pin to which a calcareous mass is attached, which was found in the vermiform appendix of a man aged 24, and was successfully removed by operation together with the appendix.

See *Male Surgical Register*, vol. iii. (1894), No. 3985*.

MEMBRANOUS CAST.

2039a. Membranous Cast from Intestine, discharged per rectum by a woman aged 29, supposed at the time to be suffering from typhoid fever.

See *Hope Ward Book* for 1894, No. 196.

SUBMUCOUS HÆMORRHAGE OF DUODENUM.

2040a-1. The specimen shows a large firm blood-clot separating the mucous and muscular coats, situated in the second part of the duodenum. It was obtained from a boy aged 15, who died four days after having been run over by a fire-escape. There was no hæmatemesis or evidence of visceral injury. The boy died from exhaustion, apparently due to intestinal obstruction. Post-mortem there was also found fat necrosis in the omental fat and pancreas.

A drawing of the parts when fresh will be found in Series lvii. No. 406a.

See *Male Surgical Register*, vol. v. (1894), No. 1881; and *Surgical Post-Mortem Register*, (1894), p. 106.

ENTERECTOMY.

2040o. A Loop of Small Intestine three days after enterectomy according to Maunsel's method, performed for strangulated femoral hernia in a woman aged 64. The gut has been opened to show the parts in their proper position. To the right the scar of the longitudinal slit-like opening is seen. To the left, where the cut ends of the gut were sutured together, there is a plug of inflammatory material which almost completely occludes the lumen of the bowel; a thin glass rod could only be passed through. From behind, the line of union of the cut ends of the intestine is clearly seen. Union was complete along all the lines of suture, and there was no leakage into the peritoneal cavity.

Four inches of gangrenous gut were removed, but three days later a laparotomy was performed, and an artificial anus made to relieve obstruction. Post-mortem there was peritonitis, and the upper part of the small intestine was considerably distended.

See *Female Surgical Register*, vol. iv. (1894), No. 663; and *Surgical Post-Mortem Register*, (1894), p. 57.

2040p. A piece of Small Intestine after enterectomy. The ends of the bowel have been sutured together and are firmly united. The union was complete, without leakage into the peritoneal cavity. The lumen of the

gut is almost completely occluded by inflammatory and plastic matter poured out along the inverted edges of the intestine, which must have caused a severe temporary obstruction. The line of union, with the sutures *in situ*, is well seen, the sutures being covered by plastic exudation.

The operation was performed for strangulated umbilical hernia; about 2 inches of ulcerated gangrenous gut were cut away about 4–5 feet above the ileo-cæcal valve. Death occurred after eight hours. Post-mortem the peritoneum was injected, and contained a little dirty brown fluid; the intestine was intact and water-tight, but there was a small leakage from the sutured mesentery.

See *Female Surgical Register*, vol. ii. (1893), No. 2324; and *Surgical Post-Mortem Register*, (1893), p. 229.

MURPHY'S BUTTON.

2040q. This specimen shows the condition of parts twelve hours after a resection of the bowel according to Murphy's method. The resection was performed on a woman aged 22 on account of a fæcal fistula of fourteen years' standing, the result of perityphlitis. A piece of small intestine with mesentery was removed and the ends brought into apposition with Murphy's button, and subsequently joined with Lembert's sutures, the sutures being carried up into the mesentery. The patient died twelve hours later in a collapsed condition.

On post-mortem examination, the button was found 5 ft. 3 in. from the ileo-cæcal valve, and the line of suture was covered with a slight amount of inflammatory lymph. Immediately above the button an enterolith was found. Windows have been cut into the walls of the gut to show the button in position.

The resected portion has been preserved in this Series, No. 1958b.

See *Female Surgical Register*, vol. ii. (1895), No. 429; and *Surgical Post-Mortem Register*, (1895), p. 62.

2040r. The specimen shows the completed union of the ends of the gut by means of Murphy's button after a resection. The position of the button is readily seen from the outside, corresponding to an annular constriction; the button can be seen both from above and below on looking into the canal of the bowel. The resection was performed on a woman aged 65 on account of obstruction due to a malignant growth in the upper part of the descending colon: 13 inches of gut were resected, and the ends of the gut joined by Murphy's method. During the operation the bowel was accidentally nicked, and the slight injury caused thereby was at once closed by a few sutures, which may be seen near the posterior aspect of the specimen. The patient died in a collapsed condition 1½ hours after the operation.

On post-mortem examination, the line of union was not very firm, liquid fæcal matter oozing out from at least three places, and water injected came out freely along the line of union. This leakage, however, was stopped when the two parts of the button were pressed more tightly together.

The specimen showing the malignant stricture has been preserved in this Series; see No. 2027h.

See *Female Surgical Register*, vol. ii. (1895), No. 1019; and *Surgical Post-Mortem Register*, (1895), p. 120.

2040s. This specimen demonstrates an accidental complication after successful reunion of the resected ends of the bowel by means of Murphy's button. The resection was performed on a very stout woman aged 50, who was admitted on account of a large strangulated umbilical hernia, which had been strangulated twice before. Herniotomy was performed, and 14 inches of small intestine were resected; the gut was much thickened and greatly distended; a 1½ Murphy's button was used. The patient survived the operation twenty-eight days, dying eventually of a large fæcal abscess and general peritonitis.

At the post-mortem examination the line of union was sound and firm, and the button was found impacted in the small intestine some 10 inches below the line of union, 5½ inches above the ileo-cæcal valve; while passing down the bowel to be evacuated it had ploughed up the mucous membrane of the intestine in several places, causing serious ulceration, which lower down was followed by sloughing and suppuration, this again leading to general septic peritonitis. The button can be seen at the lower end of the specimen. One of the ulcers shows the ribbed appearance of its base, this being due to the prominence of the circular muscular fibres.

See *Female Surgical Register*, vol. ii. (1895), No. 677; and *Surgical Post-Mortem Register*, (1895), p. 101.

EXPERIMENTAL ENTERORRAPHY.

2040t. Two specimens of Small Intestine of a dog, showing the results of an experimental circular enterorraphy.

(1.) In the upper one, with the exception of the adhesion of omentum to the site of the operation, there is no indication, from the outside, of anything having been done. On the inside the line of union is marked by a slight projection into the lumen of the bowel, caused chiefly by thickening of the mucous and submucous coats; this would probably have grown less in time, even if it had not altogether disappeared.

Section shows a small neat scar firmly and evenly uniting the two ends.

This specimen was taken from a dog, which made a perfect and uneventful recovery, and was killed sixty-six days after the operation.

(2.) The lower specimen shows the results of obstruction following operation. The uniting scar is stretched and thinned to such an extent as to appear translucent when held up to the light. The intestine below is of normal size, while that above is much dilated, and its coats are hypertrophied in a way such as is commonly found after chronic obstruction. There is no contraction of the lumen of the gut opposite the scar.

This specimen was taken from a dog which died suddenly twenty-seven days after operation. No symptoms of obstruction were observed, and the animal took food well till the day before its death. On examination, the dilated portion of intestine above the scar was found completely blocked by a hard mass, consisting of short pieces of bone, straw, &c., which was with difficulty broken up and removed. One piece of bone was lying almost transversely across the gut,

and the obstruction appears to have been due to the inability of the newly-formed fibrous ring to dilate in order to allow of its passage, and not to contraction of the scar.

Suspended above the specimens is a decalcified bone tube similar to those used in the operations, which were performed as follows:—A portion of intestine having been resected, the bone-tube is introduced, and the ends are tied over it by silk ligatures, which lie in the grooves, and are thus prevented from slipping. Escape of intestinal contents is thus prevented, and the two ends are then rapidly approximated by a continuous or interrupted suture.

For full account, *vide British Medical Journal*, vol. ii. (1894), p. 65.

Presented by R. C. Bailey, Esq.

2040u. A similar specimen, showing firm and satisfactory union. The coil of gut is somewhat sharply kinked owing to contraction of the mesentery in healing. The intestine on the proximal side of the wound is slightly dilated. The scar, as in the other specimen, is small and neat, and forms a slight projection into the lumen of the gut.

This specimen was taken from a dog killed thirty days after operation.

All three specimens illustrate the tendency of the omentum to adhere to wounded surfaces; no special means having been adopted to secure such union.

Presented by R. C. Bailey, Esq.

SERIES XIX.

DISEASES OF THE RECTUM AND ANUS.

ADENOMATOUS POLYP OF RECTUM.

2063a. A large soft Papillomatous Growth springing from the mucous membrane of the rectum, and on microscopic examination found to be a so-called adenomatous polyp, innocent in character.

See *Female Surgical Register*, vol. ii. (1892), No. 1357.

MELANOTIC SARCOMA OF RECTUM.

2073c. The Lower Part of the Rectum is occupied by a dark and almost black growth, which reaches down almost to the anal margin. Above it can be seen through and underneath the mucous membrane, infiltrating the coats of the gut and extending into the tissues around. On turning the specimen, it is seen that the growth occupies the space between the rectum and bladder on the left; black spots (melanotic nodules) are seen through the mucosa of the bladder and in the prostate gland, and a few small ones also in the recto-vesical tissue on the right side. Douglas's pouch and the peritoneum covering the rectum and bladder are extensively occupied by secondary melanotic deposits, which grow from the surface of the peritoneum as small polypoid growths.

See also Series xvi. No. 1886c, and Series xxi. No. 2215a.

Presented by H. J. Waring, Esq.

SERIES XXI.

DISEASES AND INJURIES OF THE LIVER.

SUPPURATIVE PYLEPHLEBITIS AND PYÆMIC ABSCESSES OF LIVER.

2206a. The Liver substance is greatly destroyed and riddled with numerous cavities of varying size. These abscesses had been filled with discoloured pus, which has been washed away, leaving irregular hollow spaces with trabeculæ and bands passing across.

From a man aged 70, who had a large malignant growth occupying the upper part of the sternum (see Series i. No. 510b). There were no malignant nodules or other morbid changes in the intestines, with the exception of fibrous thickening around the appendix, probably the result of previous inflammation.

See *Male Surgical Register*, vol. i. (1891), No. 1874.

2206b. The specimen resembles the previous one, excepting that the destructive changes are more extensive. The liver is riddled with cavities, which at the time of the post-mortem examination were filled with pus. The suppuration had extended upwards, leading to the formation of a sub-diaphragmatic abscess and to a large empyema.

The post-mortem examination further revealed a perforation of the vermiform appendix, through which an elongated ovoid fæcal concretion protruded, like a date-stone in shape and size. This on withdrawal was found to contain a pin, of which the pointed end appeared outside. There was also well-marked perityphlitis, a pyæmic abscess in the brain, and another in the left calf which had been opened during life. Before death the seventh rib on the right side had been resected with the view of affording an outlet for the pus from the liver.

See *Luke Ward Book*, (1894), *sub* George Richardson; and *Medical Post-Mortem Register*, vol. xxi. p. 140.

MELANOTIC SARCOMA.

2209b. Numerous black nodules, greatly varying in size, are seen in the substance, and under the capsule. of the liver. There is also a large melanotic mass on the under surface. The primary growth was found in the rectum and has been preserved. See Series xix. No. 2073c.

Presented by H. J. Waring, Esq.

CARCINOMA.

2216d. The substance of the Liver is occupied by numerous cancerous deposits of varying size. The largest, in the centre of the specimen, shows the degeneration in the deeper parts, the softened matter having fallen out, leaving a ragged cavity. Other nodules similarly, but to a less degree, show the central softening and breaking down. The surface of the liver is uneven and nodular. The primary growth was found in the rectum.

See *Male Surgical Register*, vol. ii. (1893), No. 3443; and *Surgical Post-Mortem Register*, (1893), p. 242.

2216e. The Liver is occupied by numerous white nodules of irregular size, which give it a bossy appearance. Some of these show the characteristic umbilication extremely well, especially one just under the sharp margin at the upper end of the specimen. The primary growth was situated in the mamma; the lungs also contained metastatic deposits.

See *Female Surgical Register*, vol. ii. (1894), No. 59; and *Surgical Post-Mortem Register*, (1894), p. 47.

SERIES XXIV.

DISEASES OF THE LYMPHATIC GLANDS.

TUBERCULAR GLANDS.

2283a. Typical "strumous" or "scrofulous" glands from the neck. They are greatly enlarged, and on section show distinct roundish, oval caseating masses or areas, breaking down in parts.

SERIES XXVI.

DISEASES OF THE THYROID GLAND.

THYROID CYST.

2310f. A small Cystic Tumour removed by an operation (enucleation) from the thyroid gland of a woman. The wall is thick, and from the lower portion a septum extends upwards, incompletely dividing the cyst cavity in two. The cyst wall shows a number of follicles filled with ordinary colloidal matter. These are especially evident at the base of the septum and at the upper pole. Besides these smaller colloidal cysts in the wall of the tumour, larger cyst-like spaces are found completely filled up by a white opalescent substance. The contents of the larger cyst are coagulated and discoloured by blood, but were no doubt colloidal.

See *Female Surgical Register*, vol. v. (1894), No. 3.

2314l. A large thick-walled Cyst removed by an operation from the thyroid gland of a man aged 67. The outer wall is smooth, the inner shaggy, and covered by shreds and tags. The cyst contained on opening chiefly blood-clot, and the irregularity of the inner wall is probably due to fibrin and organising clots.

There was dysphagia and dyspnœa before the operation, and the larynx was pushed upwards and to the right.

See *Male Surgical Register*, vol. v. (1893), No. 1638.

2314m. A large thin-walled Cyst removed by an operation from the thyroid gland of a man aged 60. The cyst is unilocular and its wall extremely thin. Its contents consisted of clear straw-coloured fluid.

There was a little dysphagia; the voice was affected on account of double abductor paralysis, and the larynx and trachea were much displaced towards the right.

See *Male Surgical Register*, vol. iv. (1894), No. 805.

2314n. A Cyst similar to the previous one, but smaller. Its walls are thin and almost translucent; it is unilocular. It was removed by an operation and contained clear straw-coloured fluid.

See *Female Surgical Register*, vol. v. (1893), No. 2463.

SERIES XXVII.

DISEASES OF THE SUPRA-RENAL BODIES.

ADENOMA.

2327a. A peculiar Tumour of the Supra-renal Gland, which was found during the post-mortem examination of a woman aged 49, who had suffered from a chronic gastric ulcer. Microscopically the growth shows what appears to be atypical supra-renal gland tissue, so that the tumour is probably an accessory or secondary supra-renal gland embedded in the primary gland.

See *Female Surgical Register*, vol. ii. (1894), No. 807; and *Surgical Post-Mortem Register*, (1894), p. 76.

SERIES XXVIII.

DISEASES AND INJURIES OF THE KIDNEYS, THEIR PELVES, AND THE URETERS.

TUBERCULAR DISEASE.

2341e. The Kidney is greatly enlarged, and its substance is almost entirely replaced by caseous breaking-down matter; yet the pyramids can still be made out more or less distinctly. The capsule is greatly thickened. During life no signs of tuberculosis or kidney trouble were made out.

From Dr. C. Eardley Wilmot.

HYDRONEPHROSIS.

2370b. The Ureters, especially the left, are greatly distended, and the Kidneys present the appearances characteristic of hydronephrosis. The bladder is but slightly enlarged, and its coats show no hypertrophy. These conditions have appeared as the result of acute retention of urine,

due to phimosis in an infant five months old, which also suffered from acute hip disease.

The hip-joint is preserved in Series ii. No. 621d.
See *Male Surgical Register*, vol. iv. (1894), No. 3815*.

RENAL CYST.

2378a. A large Single Cyst springing from the outer margin of the Kidney. It was filled with clear fluid, and its wall is thinned in places and ribbed by prominent ridges. The kidney itself is granular, and shows all the signs of interstitial nephritis. There is a considerable loss of renal substance, produced by pressure of the growing cyst and consequent absorption.

Both kidneys were granular; the heart weighed 14 oz., but there was no valvular lesion.

SERIES XXX.

DISEASES AND INJURIES OF THE BRAIN AND ITS MEMBRANES.

CEREBRAL HÆMORRHAGE.

2474a. A Coronal Section through the Hemispheres, showing a large and extensive hæmorrhage, which had forced its way into the lateral ventricles.

See *Medical Post-Mortem Register*, vol. xxii. (1895), p. 75.

HYDROCEPHALIC SKULL.

2521b. A typical Hydrocephalic Skull, obtained from a child aged 7. The head while fresh measured 10$\frac{3}{4}$ inches in its antero-posterior diameter, and 7$\frac{1}{2}$ in its broadest transverse diameter, and in circumference 30$\frac{3}{4}$ inches, and contained about 11$\frac{1}{2}$ pints of fluid.

Presented by H. J. Johnson, Esq., M.B.

SERIES XXXIII.

DISEASES AND INJURIES OF THE EYE.

RODENT ULCER.

2577a. An Eye with portion of the Lower Eyelid and part of the Orbit, removed after death from a woman aged 49. The lower eyelid is in an ulcerated condition and almost completely destroyed. The ulceration has not attacked the globe of the eye itself, but is extending across the inner canthus into the upper eyelid. Microscopically it was shown to be a rodent ulcer.

See *Female Surgical Register*, vol. ii. (1894), No. 597.

DISORGANISED EYE.

2580a. An Antero-posterior Section through an Eye, showing the scar of an old perforating ulcer on the cornea, absence of the anterior chamber, and almost complete atrophy of the lens.

See *Ophthalmic Ward Book*, (1895), No. 409.

STAPHYLOMA.

2583a. An Antero-posterior Section through a Staphylomatous Eye. It is greatly enlarged and elongated in its antero-posterior diameter; the lens is shrivelled, and the anterior chamber has disappeared.

See *Female Surgical Register*, vol. iii. (1895), No. 1254.

WOUND AT CILIARY REGION.

2593b. The specimen shows an injury at the ciliary ("dangerous") region of the Eye, a penetrating wound at the sclero-corneal junction. An iridectomy was performed downwards, which is well shown in the specimen. Irritation and pain followed, and the eye had to be removed.

See *Ophthalmic Ward Book*, (1895), No. 1316.

GLAUCOMA.

2608a. The specimen shows the glaucomatous cup in its most typical form.

The eye (right) was removed from a woman aged 66. Five years before, the right lens had been extracted and two needling operations were done subsequently: repeated attacks of inflammation with failing vision followed.

See *Ophthalmic Ward Book*, (1894), No. 911.

2608b. An Antero-posterior Section through an Eye, removed for acute glaucoma, showing the cupping of the disc characteristic of the disease.

See *Ophthalmic Ward Book*, (1895), No. 234.

FOREIGN BODY.

2651d. An Antero-posterior Section through an Eye, showing a small foreign body (a piece of metal) in the vitreous at the posterior part of the lens. There are complete posterior synechiæ, and of the lens only a remnant is left; the retina is completely detached (umbrella-detachment).

See *Ophthalmic Ward Book*, (1895), No. 474.

SERIES XXXIV.

DISEASES OF THE EAR.

AURAL POLYPUS.

2685b. A large Polypoid Growth, removed by operation through the external meatus from the middle ear of a girl aged 11, who for years had suffered from chronic middle ear disease. The polyp had occupied the whole of the external meatus and had appeared externally. It was covered with thick squamous epithelium.

A drawing of the ear will be found in Series lvii. No. 757. A microscopic specimen has been preserved in Series lv.

See *Female Surgical Register*, vol. v. (1895), No. 666.

SERIES XXXV.

DISEASES AND INJURIES OF THE SKIN.

RODENT ULCER OF GROIN.

2720d. This specimen was removed by operation from the left groin of a woman aged 43. Microscopically it proved to be a rodent ulcer; and the specimen is therefore of interest, being a rodent ulcer in an unusual position. The hair-follicles at the upper margin of the ulcer are greatly distended and prominent.

Ten years ago a small pimple appeared between the left labium majus and the groin. This ulcerated subsequently, and nine months before the operation the ulcerative process began to spread rapidly. The neighbouring glands were not enlarged or hard.

See also *Female Surgical Register*, vol. v. (1893), No. 844.

REGENERATION OF FINGER-NAIL.

2732d. A Dorso-ventral Sagittal Section through the Terminal Phalanx of a boy aged 16, which had been amputated on account of necrosis of the phalangeal bone, the result of tubercular disease. The line of junction between the dying and the new portions of the nail is distinctly seen.

See *Male Surgical Register*, vol. ii. (1895), No. 314.

SERIES XXXVI.

DISEASES OF THE TESTICLE.

TUMOUR FROM TUNICA VAGINALIS.

2754b. Several small Tumours which grew from the Tunica Vaginalis, and were removed by operation. They are hard, and on cutting through them distinctly gritty. On superficial examination they seemed to be cartilaginous growths, but microscopic investigation proved them to consist of a hard, dense, fibrous stroma, in which numerous sandy, round, concentric bodies were distributed, identical in appearance and from their chemical and staining reactions with the psammamatous bodies found in the pineal gland, the choroid plexuses and the dura mater.

A microscopical specimen has been preserved in Series lv.

Presented by C. B. Lockwood, Esq.

TUBERCULAR DISEASE.

2774e. The specimen was removed by operation from a young child. The epididymis is greatly diseased, the body of the testis being practically unaffected. Four typical caseating nodules replace the diseased epididymis. A ragged breaking-down mass occupies the lower portion of the specimen, where the growth during life had fungated through the scrotum.

See *Male Surgical Register*, vol. iii. (1892), No. 890.

CYSTIC SARCOMA.

27971. The Testis is uniformly enlarged, and on section shows numerous cystic cavities with smooth walls, which contained a clear mucoid fluid.

Removed by operation from a youth aged 17.
Microscopical examination proved the growth to be a cystic sarcoma.
See *Male Surgical Register*, vol. iv. (1894), No. 360.

SERIES XLIII.

DISEASES OF THE UTERUS.

POLYP OF CERVIX UTERI.

2967b. The specimen is one of the rarer varieties of cervical polypi, viz., the "channelled" variety. The growth is riddled with cavities of irregular size. These had been filled with thick mucous secretion. The polypus was removed by operation.

SLOUGHING FIBROID.

2992b. A Uterus with a large Fibroid Tumour divided in the mesial line. The fibroid has developed from the anterior wall, and has filled up and expanded the anterior fornix very considerably. The upper part of the uterine wall is unaltered, and the uterine cavity and cervical canal are not encroached upon. The free surface of the tumour is in an ulcerated and sloughing condition, and large spaces and vessels are seen in the substance of the fibroid mass, especially at its uterine attachment.

See *Medical Post-Mortem Register*, vol. xviii. p. 24; and *Elizabeth Ward Book* for 1891, No. 15.

CARCINOMA OF UTERUS.

3010b. The Body of the Uterus is uniformly enlarged, its walls being considerably thickened by a growth which evidently has grown from the surface into the muscular tissue of the womb. The free surface of the growth is ragged, uneven, and shreddy. The growth undoubtedly began in the body of the uterus, and only towards the end, just before removal, extended into the cervix; for though the cervical canal is dilated, the cervical mucous membrane is but slightly affected.

Microscopical examination proved the growth to be a villous carcinoma.

SERIES XLIV.

DISEASES OF THE VAGINA AND EXTERNAL ORGANS OF GENERATION IN THE FEMALE.

EPITHELIOMA OF LABIUM.

3034a. An Epitheliomatous Mass removed from a woman by an operation. It occupied the left labium and the pubic region. The clitoris is unaffected.

See *Female Surgical Register*, vol. iv. (1893), No. 1413.

SERIES XLVIII.

DISEASES OF THE MAMMARY GLAND.

CHRONIC MASTITIS.

3142c. A Section through a Breast which has been removed on account of supposed malignant disease. The breast is very hard, and its substance is intersected by numerous white bands of firm fibrous tissue; a few cysts are visible on the surface.

Microscopically there was total absence of new growth of any kind, malignant or otherwise, although a few cysts (involution cysts) were observed, and there was a considerable increase of connective tissue.

See *Female Surgical Register*, vol. i. (1894), No. 849.

SERIES L.

GENERAL PATHOLOGY.

IRON REACTION.

3220a. A Section of a Liver from a case of pernicious anæmia, half of which has been treated with ferrocyanide of potassium and hydrochloric acid. The Prussian-blue tint shows the presence of free iron, said to be characteristic and pathognomonic of pernicious anæmia. Microscopically the liver, treated in a similar manner, also showed the presence of free iron in and between the liver cells.

The kidney and spleen reacted similarly (see next specimen).

See *Medical Post-Mortem Register*, vol. xxi. (1894), p. 16; and *Mary Ward Book*, (1894), *sub* Elizabeth Lines.

3220b. Kidney from the same case of pernicious anæmia as the previous specimen, showing the characteristic Prussian-blue reaction. The spleen gave the same reaction.

3220c. The Section of the Kidney has been tested for free iron by potassium ferrocyanide and hydrochloric acid; the cortex and the columns of Bertini are stained a decided Prussian-blue, while the pyramids of the medulla are only faintly blue. The kidney was removed from a man aged 55, who had suffered from pernicious anæmia.

The spleen and a piece of the sternum of the same case have been preserved in this Series (see following specimens).

See *Mark Ward Book*, *sub* Charles Andrews; and *Medical Post-Mortem Register*, vol. xxii. p. 88.

3220d. A Section of the Spleen of the same case, showing the iron reaction.

3220e. A Section of the Sternum from the same case. On applying the iron test the marrow gave the typical blue reaction.

3220f. A Piece of the Liver which shows the iron reaction in a distinct manner. The liver was removed from a child aged 2 years, who suffered

from anæmia (mixed splenic and lymphatic leukæmia): the spleen was enlarged as well as the abdominal lymphatic glands. The blood during life showed all the appearances characteristic of mixed leukæmia, *i.e.*, there was marked leucocytosis, increase of lymphocytes, and also of eosinophile elements. This specimen should be considered together with No. 3220a, for it proves that the iron reaction is not pathognomonic or characteristic of pernicious anæmia.

See *Mary Ward Book*, (1894), No. 199; and *Medical Post-Mortem Register*, (1894), vol. xxi. p. 267.

3220g. The Section of Liver has been prepared in the same manner as the preceding specimens to show the iron reaction. It was obtained from a man who died of croupous pneumonia and who had jaundice at the time of death. It illustrates the occasional presence of free iron in non-anæmic conditions.

See *Medical Post-Mortem Register*, vol. xxii. p. 69.

STRUMOUS DACTYLITIS.

3239b. The Ring-Finger of the Right Hand, removed from a child 3 years of age on account of tubercular disease of six months' duration.

DIFFUSE LIPOMA.

3250b. Two large Masses of Adipose Growth removed from the back of a man's neck.

See *Male Surgical Register*, vol. v. (1893), No. 3012; and *Photographs*, Series lvii. Nos. 1194a and 1194b.

MELANOTIC SARCOMA OF CHEEK.

3314b. The Tumour before removal formed a round pigmented mass in the cheek. On section it shows three larger pigmented, slate-coloured deposits or collections embedded in the substance of the growth; but besides these there is a general diffuse pigmentation of the surface. Pigmented patches are also seen through the cutaneous surface.

The growth was removed by an operation from an old woman aged 84, who had first noticed the swelling twelve months previously. Two months after the operation a gland affected secondarily had also to be removed. The latter on section was similarly pigmented. Microscopically the growth was found to be a typical melanotic sarcoma.

A drawing of the growth made before the operation will be found in Series lvii. No. 1214a.

See *Female Surgical Register*, vol. ii. (1894), Nos. 20 and 535.

PAPILLOMA OF CHEEK.

3323c. A large Papillomatous Tumour which grew from the mucous surface of the left cheek of a man aged 53. For three or four years the growth had remained stationary and was no larger than a pea. During the six months before removal by operation it had grown rapidly to its present size and shape. The patient had been a great smoker,

and although clinically epithelioma had been suspected, the microscope revealed the nature of the tumour to be an innocent papillomatous growth.

See *Male Surgical Register*, vol. i. (1894), No. 1010.

COLLOID CARCINOMA.

3338a. A Section through a Breast removed from a woman aged 49. The glandular portion of the mamma is totally occupied by a colloidal mass, opalescent and glistening in appearance, which proved to be a colloid carcinoma. The axillary glands also were enlarged and colloidal. The specimen is preserved in carbolised glycerine gelatine, a method of embedding allowing of a clear and distinct differentiation of the various parts in nearly their normal tints.

See *Female Surgical Register*, vol. v. (1895), No. 679.

SERIES LI.

MISCELLANEOUS SPECIMENS.

3386b. Artificial Teeth and Plate passed per rectum by a woman aged 38. On admission the plate was felt in the œsophagus, but could not be extracted; six days later it was passed per anum without any bad symptoms. The same accident had happened once before.

See *Female Surgical Register*, vol. iii. (1893), No. 247.

SERIES LIII.

CALCULI AND OTHER CONCRETIONS FORMED IN THE DIGESTIVE ORGANS.

GALLSTONE.

267a. A Calculus obtained from the Gall Bladder, consisting almost entirely of pure cholesterin.

Presented by H. J. Waring, Esq.

SERIES LV.

PATHOLOGICAL MICROSCOPIC SPECIMENS.

GIANT-CELLED SARCOMA.

58a. A Giant-cell Sarcoma of the Patella, containing a strikingly large number of giant-cells.

From Series i. No. 453b.

BRONCHO-PNEUMONIA.

151a. Large Section through a whole Lobe of Lung affected with broncho-pneumonia of the ordinary type, stained with carmine. Irregular areas and patches of the lung are consolidated. At (*a*) the arrangement of the solid alveoli around the smaller bronchi is well shown. Besides the larger consolidated patches there are also smaller solid patches scattered through the lung substance. The enlarged bronchial glands opposite (*b*) are also well shown.

See *Medical Post-Mortem Register*, vol. xxii. p. 56.

Presented by H. Tooth, M.D.

151b. Large Section through a Lung affected with broncho-pneumonia and marked destructive changes, showing small areas of consolidation, and also widely dilated bronchioles and numerous small cavities of irregular sizes and shapes due to destruction of tissue in the affected area. This destruction was followed by emphysematous distension of many of the broken-down alevoli, so that at first sight the section resembles that of an ordinary emphysematous lung.

See *Medical Post-Mortem Register*, vol. xxi. (1894), p. 248.

Presented by H. Tooth, M.D.

CASEOUS BRONCHO-PNEUMONIA (TUBERCULOSIS).

151c. Large Section through a whole Lobe of a child's Lung affected with caseous broncho-pneumonia, probably tubercular in nature. On holding the specimen against the light, the broncho-pneumonic character of the areas of consolidation is readily recognised. Many of the smaller bronchi and bronchioles are distended. The caseous patches appear as pink semi-transparent areas, and are generally surrounded by a zone of opaque matter, *i.e.*, the consolidated alveoli of the lung. On using the low power of the microscope, these points come out more clearly, and it will also be seen that the caseous substance is generally found in small cavities lined by several layers of columnar epithelium, *i.e.*, in dilated bronchioles. The alveolar septa have broken down in many places, and many of the air vesicles are distended (emphysema). Giant-cells cannot be detected, but judging from the general distribution of the broncho-pneumonia, the abundant caseation, and the numerous cavities lined by columnar epithelium, the process is almost certainly tubercular.

See *Medical Post-Mortem Register*, vol. xxii. p. 1.

Presented by H. Tooth, M.D.

TUBERCULOSIS.

151d. Large Section through a whole Lobe of a consolidated Lung affected with tuberculous, caseous broncho-pneumonia (so-called caseous pneumonia). The numerous caseating patches are clearly seen on holding the specimen up to the light, and the lung is almost completely solidified. The bronchial glands are much enlarged and caseous (*a*). On examining the specimen with a low power the caseation and numerous giant-cells are readily recognised.

See *Medical Post-Mortem Register*, vol. xxii. (1895), p. 21.

Presented by H. Tooth, M.D.

MILIARY TUBERCULOSIS.

161a. Large Section through a whole Lobe of a Lung affected with miliary tuberculosis. The dissemination of the tubercles is well shown, and the structure of the individual tubercles is also typical, the centre of each being caseating. The bronchial glands (*a*) are enlarged, caseous, and tubercular. On examining the specimen with the low power of a microscope the structure of the tubercles is well seen.

See *Medical Post-Mortem Register,* vol. xxii. (1895), p. 29.

Presented by H. Tooth, M.D.

ŒSOPHAGEAL WART.

241a. Section through an Œsophageal Wart. It shows the hyperplasia and thickening of the surface epithelium, the papillomatous hypertrophy of the subepithelial connective tissue, in which there are also collections of leucocytes.

From Series xv. No. 1857a.

FIBROMA.

243. Section of a Small Tumour growing from the mesentery. The substance of the growth is dense fibrous tissue, and contains a number of calcareous and earthy particles, round in shape with a wavy outline and concentrically arranged, resembling the psammomatous granules normally found in the dura mater of the skull and spinal canal.

From Series xvi. No. 1885b.

243a. Section of a Small Fibrous Tumour growing from the peritoneal coat of the large intestine. The tumour is an ordinary hard fibroma, in parts almost cartilaginous.

From Series xvi. No. 1885a.

COMPRESSION.

452. A Series of Sections to show the effect on the Spinal Cord of an extra-dural tumour causing compression of the lower dorsal cord. The cord sections have been stained by Weigert's method, the tumour itself with carmine: the latter is a round-celled sarcoma. The compression has led to marked ascending changes in the postero-median columns and in the ascending antero-lateral tracts of Gower. The gradual recession of the degenerated area in the postero-median column higher up is plainly shown. In the upper cervical section the anterior and lateral portions are free from degenerative changes and are deeply stained. In the dorsal region just above the tumour there has been marked distortion of the grey matter and the tracts in the white matter, and the right posterior cornu is occupied by a secondary deposit.

The letters refer to the various regions of the cord.

Presented by H. Tooth, M.D.

INTRA-DURAL GROWTH.

452a. A Series of seventeen transverse Sections through the Spinal Cord and its membranes, showing the presence of a new growth inside the

dural sheath (intra-dural growth), which extends all the way down the cord. The specimens explain themselves and can be examined with a low power. The growth is a round-celled sarcoma. On staining with Marchi's fluid, nerve-degeneration could be observed. The specimens have been stained a modification of Pal's method and carmine as a counterstain.

The letters on the frame refer to the various regions of the cord: C=cervical D=dorsal, and L=lumbar.

See *Medical Post-Mortem Register*, vol. xxi. (1894), p. 51.

Presented by H. Tooth, M.D.

LOCOMOTOR ATAXIA.

455. A Series of twenty-one transverse Sections through the Spinal Cord, stained by Weigert's method, showing the lesions characteristic of locomotor ataxia. The whole of the posterior columns are degenerated (*i.e.*, have remained unstained) over the entire length of the cord.

The letters on the frame refer to the various spinal regions: M = medulla, C, D, L, cervical, dorsal, and lumbar respectively.

Presented by H. Tooth, M.D.

457a. A Series of twenty-one transverse Sections through the Spinal Cord, stained by a modification of Pal's method, showing the typical lesions of tabes dorsalis (locomotor ataxia) with neuritis of the posterior roots. The degenerate areas, *i.e.*, the posterior columns, are left unstained. It will be seen that in the cervical region only a part of the posterior column is degenerated, while from the dorsal region downwards the whole area between the posterior cornua is affected.

The letters on the frame refer to the various regions of the cord: C = cervical, D = dorsal, and L = lumbar.

Presented by H. Tooth, M.D.

DESCENDING DEGENERATION.

460. A Series of twelve Sections through the Crus, Pons, Medulla, and Cord, stained by Weigert's method, showing the paths of degeneration after softening of the right internal capsule. There was during life left hemiplegia. In the cord there is evident degeneration of the right direct and the left crossed pyramidal tracts, which have not taken the dark blue stain, but remain pale. In the last section, that of the lumbar region, the degeneration is found in the crossed pyramidal tract only, the direct being apparently unaffected. Tracing the degenerated tracts upwards, they are found on the right side near the lower surface of the medulla, pons, and crus respectively.

The letters on the frame refer to the various parts of the nervous system affected: D = dorsal, L = lumbar, M O = medulla oblongata, P = pons, C = crus.

Presented by H. Tooth, M.D.

FRACTURE DISLOCATION.

465. A Series of twenty transverse Sections through the Medulla and various regions of the Cord, stained by Weigert's method, showing

ascending and descending changes, the result of a fracture-dislocation at the seventh cervical vertebra. In the cervical region there is an ascending degeneration of the posterior columns, most intense in the postero-median columns, traceable into the medulla as degenerated tracts (unstained), at the upper surface. The direct cerebellar tracts are also unstained (or degenerated) in the cervical region, and can be traced into the medulla.

In the dorsal region the descending changes are well shown, affecting chiefly the crossed pyramidal tracts, which remain unstained all the way down, while the degeneration is much less marked in the direct pyramidal tracts. Immediately below the seat of injury there are marked degenerative changes in the posterior columns, and the comma-shaped tracts can be traced downwards for a considerable distance in the dorsal region.

The letters refer to the various regions of the cord.

Presented by H. Tooth, M.D.

466b. A Series of twenty-five transverse Sections through a Spinal Cord, stained by a modification of Pal's method, showing both ascending and descending degeneration, the result of a fracture-dislocation at the 11th dorsal vertebra. The ascending degeneration affects the posterior column and especially the postero-median part thereof, on both sides. At the 11th dorsal, marked D 11 on the frame, the posterior white columns, have been completely destroyed, and ascending from them the degeneration in the posterior columns is well shown, becoming less as higher levels are reached, *i.e.*, the degenerated area recedes both from the sides and from the grey commissure, so that in the cervical region the posterior and mesial portions only are affected. The descending degeneration affects especially the crossed pyramidal tracts in the lumbar region. There is also a noticeable ascending degeneration in the antero-lateral white columns.

The various areas of the cord have been indicated by letters on the frame.

Presented by H. Tooth, M.D.

AURAL POLYPUS.

504. Section of an Aural Polypus which was removed through the auditory meatus. Its surface is covered by squamous epithelium; its substance consists of cellular connective tissue.

From Series xxxiv. No. 2685a.

RODENT ULCER.

533a. Section of a typical Rodent Ulcer which was situated at the groin.

From Series xxxv. No. 2720d.

PSAMMO-FIBROMA.

552a. Section through a Tumour which grew from the Tunica Vaginalis. It consists of dense fibrous tissue in which there are embedded a number of concentrically arranged calcareous and earthy bodies, identical with the psammomatous granules in the dura mater, so that this tumour may be called a psammo-fibroma.

From Series xxxvi. No. 2754b.

SERIES LVI.

CASTS AND MODELS.

ACROMEGALY.

1e. Cast of the Left Hand of a man aged 58 who had acromegaly.

1f. Cast of the Right Foot of the same case.

1g. Cast of the Upper and Lower Jaws of the same case.
See *Male Surgical Register*, vol. ii. (1894), No. 2998.

1h. Casts of two Hands from a man showing the conditions characteristic of so-called pseudo-hypertrophic pulmonary arthropathy. The patient suffered from phthisis.

1i. Cast of Dorso-Cervical Region of Back of the same man, showing kyphosis.

EXOSTOSES.

6b-1. Cast of Right Hand, Forearm, and Elbow showing two Exostoses, one on the dorsal surface over the lower end of the ulna, and another on the palmar surface above the wrist, and a third springing from the first phalanx of the middle finger.
The cast was taken from the arm of a young girl aged 17 affected with multiple exostoses.
See *Female Surgical Register*, vol. ii. (1894), No. 588.

6b-2. Cast showing an Exostosis growing from the first phalanx of the middle toe of a woman aged 37. The toe with the outgrowth was subsequently removed by operation.
See *Female Surgical Register*, vol. ii. (1894), No. 2389.

GENU VARUM.

19d. Cast of the Right Knee of a girl aged 15 with well-marked Genu varum.
See *Female Surgical Register*, vol. ii. (1893), No. 78.

CHARCOT'S DISEASE.

20m-1. Cast of Right Knee of a man aged 46 who suffered from Charcot's Disease.
See *John Ward Book*, (1894), *sub* William Hood.

RHEUMATOID ARTHRITIS.

20t. The Hands of a man aged 39 who suffered from Chronic Rheumatoid Arthritis.
See *Mark Ward Book*, (1895), *sub* William Harwood. See also next cast, which represents the foot of the same patient.

20u. Cast of the Right Foot belonging to the previous case.

GOUT.

23k. Gouty Tophus around the Right Elbow of a woman aged 63.

A cast of the left hand has been preserved in this Series, No. 23l.
See *Faith Ward Book*, (1895), *sub* Susan E. Mead.

23l. Painted Cast of the Left Hand of the same woman, showing ulcerating large tophi.

A cast of the elbow has been preserved in this Series, No. 231c; and a drawing of both hands in Series lvii. No. 1161a.

TRANSVERSE FRACTURE OF PATELLA.

27b. A Cast showing the deformity produced by an ununited Transverse Fracture of the Patella. The fragments of the patella had been fixed by means of "all-round subcutaneous wiring" twelve months previously. The wire had slipped and the fragments separated; the wire caused a ridge under the skin, which is represented in the cast.

See *Male Surgical Register*, vol. ii. (1895), No. 654.

POTT'S FRACTURE.

31c. Cast of the Left Foot and Leg of a woman, showing the deformity produced by a badly set Pott's Fracture.

STUMPS.

35c-1. Cast of a Stump $9\frac{1}{2}$ years after a Chopart's amputation.

A cast of the stump 17 months after operation has been preserved in this Series, No. 35c.

35c-2. Cast of a Stump of Left Leg 10 years after a Chopart's amputation.

FRACTURE AT WRIST.

45b. Cast of the Right Hand and Forearm of a young woman aged 19, with a fracture about the wrist-joint.

DISLOCATION OF FOOT.

56a. Cast of Left Ankle-Joint, showing complete dislocation of left foot inwards, with incomplete dislocation of the astragalus outwards, the result of a fall.

See *Male Surgical Register*, vol. ii. (1895), No. 1371.

FLAT FOOT.

90a-l. Cast of the Left Foot of a young man who had flat foot and talipes valgus.

HALLUX VALGUS.

90c. Cast of the Feet of a man showing well-marked hallux valgus on either side, the great toes being turned in, and being overlapped by the adjoining toe.

90d. Cast of the Right Foot of a boy showing both hallux valgus and hammer-toe (middle toe).

TALIPES VALGUS.

93d. Cast of the Right Leg and Foot, six months after an operation performed for extreme talipes valgus A cast was taken before the operation to show the deformity. (See Cast 93c.)

FEMORAL HERNIA.

132a. A Cast showing a large Femoral Hernia in a man 45 years of age.

Photographs of the same case are found in Series lvii. No. 463a.
See *Male Surgical Register*, vol. iii. (1895), No. 1091.

DERMOID CYST.

205b. Cast of Right Side of Face and Neck of a young man aged 20, showing a swelling under the right ear and angle of the lower jaw, which was removed by an operation and found to be a dermoid cyst.

See *Male Surgical Register*, vol. v. (1894), No. 3223.

SERIES LVII.

DRAWINGS AND PHOTOGRAPHS OF DISEASED OR INJURED PARTS.

OSTEITIS DEFORMANS.

16a. Three Photographs demonstrating the characteristic appearances in the head, arm, and leg of a man affected with osteitis deformans.

See *Male Surgical Register*, vol. ii. (1893).

OSTEOTOMY.

24a. Three Photographs of a boy aged 15, showing the results of McEwen's osteotomy performed on the left leg for genu valgum.

See *Male Surgical Register*, vol. ii. (1893), No. 1920.

ARTHRECTOMY.

78a. Photograph of the Right Leg of a woman on whom arthrectomy of the knee-joint has been performed.

See *Female Surgical Register*, vol. v. (1894), No. 1195.

INFANTILE PARALYSIS.

143b. Photograph of the Right Foot of a man aged 40, showing great deformity, the result of infantile paralysis many years ago. The foot was amputated at request of the patient, on account of pain, ulceration, and uselessness.

A cast of the foot has been preserved in Series lvi. No. 73e.
See *Male Surgical Register*, vol. i. (1893), No. 2524.

143c. Photograph of the boot used by the patient of whom the previous photograph was taken.

ORBITAL ANEURYSM.

191a. Drawing of the Face of a man aged 35, in profile, showing marked proptosis and aneurysmal dilatation of the vessels of the orbit. A typical specimen of so-called orbital aneurysm. (L. Mark, Esq.)

See *Male Surgical Register*, vol. i. (1895), No. 637.

ULCER OF TONGUE.

300. Drawing of the Tongue and Lower Part of Face of a woman aged 36, showing small multiple ulcers on the dorsum linguæ, and also a small ulcer at the right nostril. Microscopically these ulcers were superficial and not malignant. (L. Mark, Esq.)

See *Female Surgical Register*, vol. v. (1894), No. 1813.

TUBERCULAR ULCER.

305a. Drawing of the Tongue of a man aged 44, showing a tubercular ulcer growing on its dorsal surface posteriorly. The ulcerated growth was locally removed by operation. (L. Mark, Esq.)

See *Male Surgical Register*, vol. v. (1895), No. 3599*.

ADENOMA OF TONGUE.

325a. Drawing of a Tumour growing from the root of the Tongue of a woman aged 32, which was removed by operation, and on microscopical examination was found to be an adenoma.

See *Female Surgical Register*, vol. v. (1895), No. 59.

340. Drawing of a Tumour growing from the Palate of a young woman aged 24. It was supposed to be a cartilaginous tumour, but after removal found to be a "fibro-adenoma." (L. Mark, Esq.)

See *Female Surgical Register*, vol. v. (1894), No. 2505.

NÆVUS OF TONGUE.

323a. Drawing of the Tongue of a man aged 30, showing a bluish nævoid tumour growing from the left margin near the tip. (L. Mark, Esq.)

See *Luke Ward Book*, (1894), *sub* John Wille.

ŒSOPHAGEAL POUCHES.

356a. Six Drawings of Diverticula or Pouches in connection with the Pharynx or Œsophagus.

(1.) Œsophageal Pouch removed by operation.
This specimen has been preserved in Series xv. No. 1833a.

(2.) Pharyngeal Pouch. Mr. Chavasse's case, copied from *Transactions of the Pathological Society*, vol. xlii. (1891), p. 82.
The specimen is preserved in the Museum of the Royal College of Surgeons, No. 2291d.

(3.) Pharyngeal Pouch. Sketch of a specimen preserved in the Museum of the Royal College of Surgeons (No. 2291), which was taken from the body of a bishop who died at the age of 90 years.

(4.) Pharyngeal Pouch. Sketch of a specimen in St. Thomas's Hospital, No. 900.

(5.) Œsophageal Pouch. Sketch of a preparation in the Guy's Hospital Museum, No. 3528.

(6.) Œsophageal Pouch. Dr. Ogle's case, copied from *Transactions of the Pathological Society*, (1866), p. 141.

The specimen is preserved in the Museum of St. George's Hospital, No. 15a or ix. 14.

This series of drawings was presented by H. T. Butlin, Esq.

NITRO-HYDROCHLORIC ACID POISONING.

382a. Drawing of the Mucous Surface of a Stomach from a case of nitro-hydrochloric acid poisoning. (L. Mark, Esq.)

SUBMUCOUS HÆMORRHAGE OF DUODENUM.

406a. Drawing of the Stomach and Duodenum removed post-mortem from a boy aged 15, who died from the consequences of an accident, having been run over by a fire-escape. There is an extensive submucous hæmorrhage in the second part of the duodenum. (L. Mark, Esq.)

The duodenum, showing the parts in section, has been preserved in Series xviii. No. 2040a-1.

See *Male Surgical Register*, vol. v. (1894), No. 1881.

FEMORAL HERNIA.

463a. Two Photographs of a large Femoral Hernia in a man aged 45.

A cast has been made and is preserved in Series lvi. No. 132a.

See *Male Surgical Register*, vol. iii. (1895), No. 1091.

BRONCHOCELE.

533a. Two Photographs of a woman aged 46, before and after removal of a bronchocele.

See *Female Surgical Register*, vol. iii. (1895), No. 562.

EXOPHTHALMIC GOÎTRE.

536a. Drawing of a girl's Face showing Exophthalmus, especially marked on the left side, and also enlargement of the neck (exophthalmic goître). (L. Mark, Esq.)

See *Mary Ward Book*, (1894), *sub* Eliza Galloway.

CRETIN.

540. Two Photographs of a Cretinous Child after feeding with thyroid extract.

See *Male Surgical Register*, vol. v. (1893).

MYXŒDEMA.

585a. Two Photographs of a woman showing the typical appearances in the face and hands due to Myxœdema.

585b. Two Photographs of a woman suffering from Myxœdema.

585c. Two Photographs of a woman suffering from Myxœdema.

See *Hope Ward Book*, (1893), *sub* Charlotte Chittick.

SUBCRANIAL HÆMORRHAGE.

655a. Drawing of a Subcranial Hæmorrhage over the anterior part of the left cerebral hemisphere. (L. Mark, Esq.)

See *Surgical Post-Mortem Register*, (1894), p. 167.

PARALYSIS OF SYMPATHETIC.

724a. Two Photographs of a man, to show the facial appearance produced by paralysis of the cervical sympathetic.

See *Male Surgical Register*, vol. v. (1893), No. 3381.

MELANOMA OF IRIS.

749a. Drawing of an Eye of a man aged 58, showing a small pigmented (black) nodule protruding from the iris near the pupillary margin. Microscopically no sarcomatous elements were found, the nodule consisting entirely of pigment cells; it is therefore probably a melanoma. (L. Mark, Esq.)

See *Ophthalmic Ward Book*, (1895), No. 1534.

AURAL POLYPUS.

757. Drawing of a large fleshy-looking Polypus appearing through the auditory meatus. (L. Mark, Esq.)

It was removed by operation, and has been preserved in Series xxxiv. No. 2685a.
See *Female Surgical Register*, vol. v. (1895), No. 666.

ERYTHEMA NODOSUM.

761a and b. Two drawings, (*a*) of Buttock and (*b*) of Left Arm, of a woman aged 38, said to suffer from erythema nodosum in an atypical form. Suppuration and ulceration occurred; there was a previous history of both rheumatism and syphilis. (L. Mark, Esq.)

See *Hope Ward Book*, (1894), *sub* Alice Howis.

LINEÆ TRANSVERSÆ.

775a. Drawings of the Knee and Arm of a girl aged 15, admitted on account of burns, showing scar-like transverse lines about the knee, bluish-red in colour, and similar lines on the arms. (L. Mark, Esq.)

See *Female Surgical Register*, vol. v. (1894), No. 1028.

PUSTULAR ECZEMA (?).

775b. Drawings of the Left Hand and Right Foot of a girl aged 13, who was suffering from a peculiar ulcerative affection of the face, hands, and feet. (L. Mark, Esq.) The appearance of the face is shown in the next drawing.

The eruption began as an erythema, which then passed successively into a vesicular, pustular, and ulcerative condition. The child died of septicæmia.

See *Faith Ward Book*, (1895), *sub* Annie Florence Johnson.

775c. Drawing of the Face of the girl from whom the previous drawing was taken. (L. Mark, Esq.)

EPIDEMIC ECZEMA.

780a. Coloured Print from the *British Medical Journal*, illustrating the appearances on the face of "Epidemic Ezcema," described by Dr. Savill.

See *British Medical Journal*, December 5, 1891.

SCLERODERMA.

828a. Photograph of the Face, Chest, and Arms of a man suffering from scleroderma.

See *Matthew Ward Book*, (1894), *sub* William Hazlewood.

INFLAMMATION OF MALE BREAST.

1059. Drawing of the Right Mamma of a man aged 28, which is acutely inflamed and enlarged by an abscess in its substance. (L. Mark, Esq.)

BURNS.

1064a. Photograph of a child's Face greatly disfigured by extensive scars after a severe burn.

See *Female Surgical Register*, vol. iii. (1894), No. 1145.

ACTINOMYCOSIS OF FACE.

1106. Drawing of Head of a woman aged 26; the left cheek and left side of the neck are attacked by actinomycotic growths. (L. Mark, Esq.)

The patient was treated chiefly with potassium iodides administered internally and superficial scraping, but no radical excision was performed. The next drawing illustrates the condition of the parts after treatment.

See *Female Surgical Register*, vol. iii. (1895), No. 746.

1106a. Drawing of the same case after medicinal treatment. (L. Mark, Esq.)

1106b. Photograph of a Right Foot and Leg of an Egyptian native affected with Mycetoma (Fungus Disease or Madura disease).

Presented by A. A. Kanthack, M.D.

LUPUS VULGARIS.

1109a. Photograph of the Face of a girl suffering from Lupus Vulgaris, who subsequently was treated with Koch's tuberculin; the treatment was followed by some improvement.

A drawing of a peculiar symmetrical eruption which appeared in the groins during the course of treatment has been made (see this Series, No. 1109b).

See *Elizabeth Ward Book*, (1895), *sub* Kathleen Quilter.

1109b. Drawing showing a peculiar Erythematous Inflammation symmetrically arranged in the groins of a young girl who was being treated with injections of Koch's tuberculin for lupus in the face.

See *Elizabeth Ward Book*, (1895), *sub* Kathleen Quilter.

LUPUS ERYTHEMATOSUS.

1113. Three Photographs, one full face and two of the right and left sides of the face, taken of a man aged 45, showing the characteristic "butterfly" rash of Lupus Erythematosus.

See *Male Surgical Register*, vol. ii. (1894), No. 1234.

SYPHILITIC SORE ON BOTH EYELIDS.

1124a. Drawing of a primary Syphilitic Sore affecting both upper and lower eyelids of the right eye of a girl aged 3. (L. Mark, Esq.)

See *Ophthalmic Ward Book*, (1895), *sub* Charlotte Herbert.

SYPHILITIC ULCERATION OF GROIN.

1126a. Drawing of the Pudenda and Groin of a young woman aged 18, showing acute inflammation of the pudenda and a large venereal (syphilitic) ulcer in the left groin. (L. Mark, Esq.)

See *Female Surgical Register*, vol. v. (1894), No. 1233.

TOPHI.

1161a. Drawings of the Right and Left Hands of a woman aged 63 suffering from chronic gout. Both hands are extremely disfigured by large tophi; the skin over these tophi has in parts ulcerated. (L. Mark, Esq.)

A painted cast of the left hand has been preserved in Series lvi. No. 23l.
See *Faith Ward Book*, (1895), *sub* Susan E. Meade.

CRETIN.

1178. Two Photographs of a Cretin aged 15, before treatment with thyroid extract.

See *Luke Ward Book*, (1894), *sub* Samuel Bambridge.

MOLLUSCUM FIBROSUM.

1186. Four Photographs of an infant affected with Molluscum Fibrosum.

See *Surgical Post-Mortem Register*, (1893), p. 213.

1186a. Two Photographs (back and front) of a man whose body was entirely covered by Molluscum Fibrosum.

History.—James Gray, aged 53, born at Deptford; growths appeared at age of 11 years; no similar growths in any other members of his family. See *Hutchinson's Archives of Surgery*, vol. ii.

SARCOMA.

1213a. Photograph of a large Sarcomatous Tumour growing from the side of an infant's head.

See *Surgical Post-Mortem Register*, (1894), p. 8.

SYPHILITIC SORE ON LIP.

1220a. Drawing of a Syphilitic Sore or hard chancre on lower lip of a woman aged 22. (L. Mark, Esq.)

See *Female Surgical Register*, vol. ii. (1894), No. 2381.

EPITHELIOMA.

1277a. Drawing of a large Fungating Epithelioma on the leg of a man aged 58. (L. Mark, Esq.)

See *Male Surgical Register*, vol. ii. (1895), No. 442.

EPITHELIOMA OF EYELID.

1279. Drawing showing an Epitheliomatous Ulcer on upper eyelid of left eye of a man aged 78. (L. Mark, Esq.)

See *Ophthalmic Ward Book*, (1895), No. 1402.

RODENT ULCER.

1293a. Drawing of a Rodent Ulcer at the corner of the mouth and near the ala nasi of a "young" man aged 25. (L. Mark, Esq.)

See *Male Surgical Register*, vol. v. (1895), No. 675.

1293b. Photograph of the same case.

CONGENITAL MALFORMATIONS.

1328a. Drawing of the Lower Part of the Back of an infant aged 2, showing a peculiar pendulous cutaneous outgrowth growing from the sacral region, and after removal by operation found to consist of fatty tissue (pendulous lipoma). (L. Mark, Esq.)

Two photographs have been prepared (see following number).
See *Male Surgical Register*, vol. i. (1894), No. 2931.

1328b and c. Two Photographs of the same case.

1328d. Drawing of the Head of an infant two weeks old, showing peculiar congenital deformities of and near external ear (accessory auricles), and also an abnormal fold at outer canthus of right eye. (L. Mark, Esq.)

1329a. Two Photographs of a boy before and after a plastic operation for hare-lip.

See *Male Surgical Register*, vol. iii. (1895), No. .

POST-MORTEM DISCOLORATION.

1356. Drawing of the Face and Chest of a man to show the appearance caused by rapid post-mortem decomposition. It was made about twelve hours after death, during the hot weather of July 1894. (L. Mark, Esq.)

ATTEMPTED SUICIDE.

1357. Drawing of the Neck and Lower Part of the Face of a woman aged 27, who, in a fit of delirium during typhoid fever, made a feeble attempt at committing suicide, succeeding only in making a series of superficial scratches. (L. Mark, Esq.)

See *Mary Ward Book*, (1894), *sub* Maud French.

PLASTIC OPERATIONS.

1360. Photograph showing the successful result of a plastic operation after the removal of a rodent ulcer in the face.

See *Female Surgical Register*, vol. v. (1893), No. 2234.

TERATOLOGICAL CATALOGUE.

SERIES IV.—ABNORMAL CONDITIONS OF THE DIGESTIVE ORGANS.

V.—ARREST OF DEVELOPMENT.

CONGENITAL CYST.

3648c. The specimen represents a sagittal section through the pelvis of an infant two weeks old, which died from the effects of intestinal obstruction. There is a large cyst below the rectum, situated between the sacrum and bladder, and causing a bulging at the anus, through which it protruded during life as a tense, bluish-red, fluctuating tumour. On turning the specimen round, it will be seen that the cyst had caused great narrowing of the lumen of the rectum, which during life it had completely obstructed. The rectum has been laid open to show the obstruction.

The cyst was filled with clear fluid; its nature remains doubtful. The lining epithelium, on microscopical examination, consisted of a single layer of flattened epithelium; ciliated columnar epithelium, as found in a similar specimen (see No. 3648b.) was absent. Probably it is a so-called coccygeal cyst, congenital in origin.

The large intestine was much distended, and there was a small perforation in the cæcum, and fæcal matter had passed into the peritoneal cavity.

See *Male Surgical Register*, vol. iii. (1894), No. 1763; and *Surgical Post-Mortem Register*, (1894), p. 95.

SERIES XXXVII.

CASTS AND MODELS OF CONGENITAL MALFORMATIONS.

114. Cast of Liver to demonstrate so-called "Congenital Fissures."

BOOKS PRESENTED TO THE LIBRARY.

1895.

	Presented by
Swanzey on the Eye (5th Edition) . .	Publishers.
The Droitwich Brine Baths, by W. H. Tomlins	Publishers.
Monroe's Anatomy, vols. i. and iii. . .	Dr. Mabyn Read.
Boyer on Diseases of the Bones, vols. i. and ii.	Dr. Mabyn Read.
Lawrence on Ruptures	Dr. Mabyn Read.
Pott's Works, vols. i. ii. and iii. . .	Dr. Mabyn Read.
Riecharand's Physiology	Dr. Mabyn Read.
Year Book of Treatment (1895 and 1896)	Publishers.
Nature, Causes, and Treatment of Cholera, by Dr. H. W. Bellew (2 Books) . .	Secretary of State in Council of India.
Difficulties of Prognosis in Insanity, by Dr. Henry Sutherland	The Author.
A Contribution to the Pathology of the Vermiform Appendix, by T. N. Kelynack, M.D.	The Author.
Harverian Oration for 1894, by T. Lauder Brunton, M.D., F.R.S. . . .	The Author.
The Diseases of the Upper Respiratory Tract, the Nose, Pharynx, and Larynx, by P. W. Williams, M.D. . . .	The Author.
Medical Annual for 1895 . . .	Publishers.
Surgical Diseases of Children, by D'Arcy Power, F.R.C.S.	The Author.
A Medico-Topographical Account of Jeypore, by Brigade-Surgeon Lieutenant-Colonel T. H. Hendley, C.I.E. . .	The Author.
Darwinism and the Medical Profession, by D. Astley Gresswell, M.D. . . .	The Author.
Surgical Pathology and Morbid Anatomy, by Anthony A. Bowlby, F.R.C.S. (1895, 3rd Edition)	The Author.

A Private Journal in Egypt, by Dr. D. H. Attfield	The Author.
Diseases of the Joints and Spine (2 Copies), by Howard Marsh, F.R.C.S.	The Author.
Graves' Clinical Medicine, vols. i. and ii.	A. A. Bowlby, Esq.
Collection of Published Writings of Sir William Gull, M.D.	A. A. Bowlby, Esq.
Medical Papers	A. A. Bowlby, Esq.
Diseases of Children's Teeth, by R. Denison Pedley, Esq.	The Author.
Hints to Medical Practitioners (Death Certificates), by A. Braxton Hicks, Esq., Coroner	The Author.
The Practice of Massage, by A. Symons Eccles, M.B.	The Author.
Traumatic Infection, by C. B. Lockwood, F.R.C.S.	The Author.

SUMMARY OF SCHOLARSHIPS AND PRIZES

OBTAINABLE BY STUDENTS AT ST. BARTHOLOMEW'S HOSPITAL.

AT ENTRANCE:—			
Senior Entrance Scholarship in Physics and Chemistry	£75	0	0
Senior Entrance Scholarship in Biology and Physiology	75	0	0
Junior Entrance Scholarship in Science	150	0	0
Preliminary Scientific Exhibition	50	0	0
Jeaffreson Exhibition	20	0	0
Shuter Scholarship	50	0	0
AT END OF FIRST YEAR:—			
Junior Scholarship in Anatomy and Biology (First)	30	0	0
Junior Scholarship in Anatomy and Biology (Second)	20	0	0
Junior Scholarship in Chemistry and Physics and Histology (First)	25	0	0
Junior Scholarship in Chemistry and Physics and Histology (Second)	15	0	0
Treasurer's Prize	5	0	0
AT END OF SECOND YEAR:—			
Senior Scholarship	50	0	0
Foster Prize	6	0	0
Harvey Prize	6	6	0
Wix Prize	5	0	0
Hichens Prize	7	5	0
AT END OF THIRD AND LATER YEARS:—			
Kirkes Scholarship and Gold Medal	30	0	0
Brackenbury Medical Scholarship	39	0	0
Brackenbury Surgical Scholarship	39	0	0
Lawrence Scholarship and Gold Medal	42	0	0
Bentley Prize	6	6	0
Skynner Prize	13	13	0
Burrows Prize	10	10	0
Matthews Duncan Prize and Gold Medal	20	0	0
AFTER QUALIFICATION:—			
Treasurer's Research Studentship	100	0	0

The total value of the Scholarships and Prizes awarded annually is about £900.

EXAMINATIONS, 1893-94.

Lawrence Scholarship and Gold Medal—
J. S. Sloane.
Brackenbury Medical Scholarship—
P. E. Turner.
Brackenbury Surgical Scholarship—
F. Fraser.
Senior Scholarship in Anatomy, Physiology, and Chemistry—
T. J. Horder.
Open Scholarship in Chemistry and Physics—
R. H. Bremridge.
Open Scholarship in Biology and Physiology—
E. C. Morland.
Open Scholarship (Junior) in Biology and Physiology—
H. A. Colwell.
Preliminary Scientific Exhibition—
J. E. Robinson.
Jeaffreson Exhibition—
G. V. Bull.
Kirkes Scholarship and Gold Medal—
H. T. Whitling.
Matthews Duncan Medal and Prize—
1. . | 2. L. Phillips.
Bentley Prize (Surgical)—
F. W. Crossman.
Hichens Prize—
J. A. O. Briggs.
Prox. acc. A. Heath.
Wix Prize—
T. J. Horder.
Harvey Prize—
1. J. H. Churchill.
2. H. C. Bennett.
3. W. R. Gibson.
Burrows Prize.
H. S. Byers.
Skynner Prize.
H. S. Byers.

PRACTICAL ANATOMY.

Treasurer's Prize—G. E. Gask.
2. { L. A. Baiss / W. T. Rowe } Æq.
4. J. H. Thursfield.
5. H. D. Everington.
6. H. Davies.
7. H. E. Waller.
8. { R. S. T. Hearne / R. Raines } Æq.

Foster Prize—H. Munday.
2. J. H. Churchill.
3. T. Brock.
4. W. R. Gibson.
5. Litler Jones.
6. D. L. Beath.
7. M. G. Dyson.
8. J. A. Dredge.

Shuter Scholarship—
{ T. H. Molesworth / S. D. Rowland } Æq.

Junior Scholarships—

Anatomy and Physiology—
1. E. C. Morland.
2. { H. Davies / T. H. Thursfield } Æq.

Chemistry and Physics—
1. W. J. Harding.
2. R. P. Brown.

EXAMINATIONS, 1894-95.

Lawrence Scholarship and Gold Medal—
J. K. Murphy.

Brackenbury Medical Scholarship—
S. Gillies.

Brackenbury Surgical Scholarship—
L. Giles.

Senior Scholarship in Anatomy, Physiology, and Chemistry—
E. C. Morland.

Open Scholarships in Science, Chemistry, and Physics—
A. L. Ormerod.

Open Scholarship in Biology and Physiology—
W. L. Brown.

Open Scholarship (Junior) in Biology and Physiology—
F. C. Borrow, S. R. Scott } Æq.

Preliminary Scientific Exhibition—
L. A. Walker.

Jeaffreson Exhibition—C. A. S. Ridout.

Kirkes Scholarship and Gold Medal—
No Award.

Matthews Duncan Medal and Prize.
T. S. Pigg.

Bentley Prize (Medical)—E. W. Groves.

Hichens Prize—No Award.

Wix Prize—C. C. I. Turnbull.

Harvey Prize—
1. H. Davies.
2. E. C. Morland.

Sir George Burrows Prize—No Award.

Skynner Prize—T. J. Horder.

PRACTICAL ANATOMY.

Junior.

Treasurer's Prize—F. C. Borrow.
2. W. H. Leonard, S. R. Scott } Æq.
4. H. Burrows.
5. A. R. Baker.
6. C. S. Frost.
7. H. S. Thomas.
8. H. Wethered.
9. C. R. Brown.
10. L. A. Walker.

Senior.

Foster Prize—R. Raines.
2. E. C. Morland.
3. L. A. Baiss, G. E. Gask } Æq.
5. A. O. B. Wroughton.
6. W. T. Rowe.
7. S. A. Millen.
8. H. E. Waller.
9. H. D. Everington.
10. F. Horridge.

Shuter Scholarship—No Award.

Junior Scholarships—

Anatomy and Physiology—
1. S. R. Scott.
2. F. C. Borrow, H. G. Wood-Hill } Æq.

Chemistry and Physics—
H. A. Colwell, E. C. Morland } Æq.

ENTRANCE SCHOLARSHIPS,

OCTOBER

1895.

Open Scholarships in Science.

Biology and Physiology—

C. S. Myers.

Chemistry and Physics-

J. Williamson.

Preliminary Scientific Exhibition—

J. C. M. Bailey.

Jeaffreson Exhibition—

H. A. Kellond-Knight.

Junior Open Scholarship in Science.

R. C. Bowden, R. H. Paramore } Æq.

ST. BARTHOLOMEW'S HOSPITAL & COLLEGE.

THE MEDICAL AND SURGICAL STAFF.

Consulting Physician—Dr. Andrew.

Consulting Surgeons—Sir J. Paget, Bart., D.C.L., LL.D., F.R.S. Mr. Luther Holden.

Consulting Ophthalmic Surgeon—Mr. Henry Power.

Physicians—Dr. Church, Dr. Gee, Sir Dyce Duckworth, Dr. Hensley, Dr. Brunton, F.R.S.

Surgeons—Mr. Thomas Smith, Mr. Willett, Mr. Langton, Mr. Marsh, Mr. Butlin.

Assistant-Physicians—Dr. Norman Moore, Dr. S. West, Dr. Ormerod, Dr. Herringham, Dr. Tooth.

Assistant-Surgeons—Mr. Walsham, Mr. Cripps, Mr. Bruce Clarke, Mr. Bowlby, Mr. Lockwood.

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. Kanthack.

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. Berry.

Administrator of Electricity—Dr. Lewis Jones.

Casualty Physicians—Dr. Roberts, Dr. Drysdale, Dr. Horton-Smith.

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. Willett, Mr. Marsh.

Clinical Surgery—Mr. Thomas Smith, Mr. Willett, Mr. Langton, Mr. Marsh, Mr. Butlin.

Descriptive and Surgical Anatomy—Mr. Walsham, Mr. Bruce Clarke.

General Anatomy and Physiology—Dr. Klein, F.R.S.

Histology—Dr. Klein, F.R.S.

Chemistry and Practical Chemistry—Dr. Russell, F.R.S.

Materia Medica—Dr. Brunton, F.R.S.

Forensic Medicine—Dr. Hensley.

Public Health—Dr. Thorne Thorne, F.R.S.

Midwifery and the Diseases of Women and Children—Dr. Champneys.

Botany—Rev. George Henslow.

Pathological Anatomy—Dr. Kanthack.

Comparative Anatomy—Dr. Shore.

Ophthalmic Medicine and Surgery—Mr. Vernon.

Mental Diseases—Dr. Claye Shaw.

Physics—Mr. F. W. Womack.

DEMONSTRATIONS.

Morbid Anatomy—Dr. Garrod, Dr. Calvert.
Diseases of the Skin—Dr. S. West.
Orthopædic Surgery—Mr. Walsham.
Diseases of the Ear—Mr. Cumberbatch.
Diseases of the Eye—Mr. Bowater Vernon, Mr. Jessop.
Diseases of the Larynx—Mr. Bowlby.
Dental Surgery—Mr. Paterson, Mr. Ackery.
Anæsthetics—Mr. Gill.
Practical Surgery—Mr. Bowlby, Mr. D'Arcy Power.
Practical Anatomy—Mr. Waring, Mr. Bailey.
Assistant-Demonstrators—Mr. Hayward, Mr. Weir, Mr. Furnivall, Mr. Sloane.
Operative Surgery—Mr. D'Arcy Power, Mr. J. Berry, Mr. H. J. Waring.
Practical Physiology—Dr. Edkins.
Assistant-Demonstrators—Dr. Bowman, Mr. Horton-Smith.
Practical Pharmacy—Dr. Calvert.
Assistant-Demonstrator—Dr. Bowman.
Surgical Pathology—Mr. Bowlby.
Morbid Histology—Dr. Kanthack.
Practical Medicine—Dr. S. West.
Assistant-Demonstrators—Dr. Andrewes, Dr. Fletcher.
Practical Midwifery—Dr. Roberts.
Medical Electricity—Dr. Lewis Jones.
Bacteriology—Dr. Kanthack.
Public Health—Dr. Waldo.
Practical Biology—Dr. Shore.
Assistant-Demonstrators—Mr. Brown, Mr. Horder.
Practical Chemistry—Dr. Chattaway.
Assistant-Demonstrator—Mr. Evans.
Curator of the Museum—Dr. Kanthack.

COLLEGIATE ESTABLISHMENT.

Warden—Dr. SHORE.

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 315.

Further information respecting Scholarships, Pupils' Appointments, and other details, may be obtained from Dr. SHORE, and at the Museum and Library.

ST. BARTHOLOMEW'S HOSPITAL REPORTS.

VOLUME XXXI.

INDEX.

Printed by Ballantyne, Hanson & Co.
Edinburgh and London

STATISTICAL TABLES

OF THE

Patients under Treatment

IN THE WARDS OF

ST. BARTHOLOMEW'S HOSPITAL

DURING 1894.

BY

THE MEDICAL REGISTRAR,

W. P. HERRINGHAM, 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.

1895.

PREFACE.

The Classification of Diseases in the Medical Tables is that adopted by the College of Physicians in their Nomenclature of Diseases.

CONTENTS.

ST. BARTHOLOMEW'S HOSPITAL.

1894.

Number of Beds in Medical Wards	206
" " " Wards for Diseases of Women	20
" " " Surgical Wards	362
" " " Ophthalmic Wards	25
" " " Unassigned	41
	654

GENERAL STATEMENT OF THE PATIENTS UNDER TREATMENT DURING THE YEAR 1894.

Patients remaining in, January 1st, 1894 :—			
Medical	182		
Surgical	320	... 502	
Admitted during the year 1894 :—			... 6,976
Medical	2,341		
Surgical	4,133	... 6,474	
Discharged :—			
Medical	1,952		
Surgical	3,970	... 5,922	
Died —			
Medical	361		
Surgical	177	... 538	... 6,976
Remaining in, January 1st, 1895 :—			
Medical	210		
Surgical	306	... 516	

Patients brought in Dead (or dying in the Surgery) ... 49

OCCUPATIONS OF MALE PATIENTS.

Accountant	...	1	Carpenters	...	37	Engineers	...	25
Acrobat	...	1	Carvers	...	3	Engine fitters	...	5
Actor	...	1	Case maker	...	1	Engraver	...	1
Agents	...	6	Caulker	...	1	Errand boys	...	9
Apprentices	...	15	Cellarmen	...	4			
Artists	...	3	Cement makers	...	3			
Asphalt layer	...	1	Chaff cutter	...	1			
Attendants	...	2	Chair makers	...	5			
Auctioneer	...	1	Chair framers	...	2	Farmers	...	7
			Cheesemongers	...	3	Farriers	...	9
			Chemists	...	6	Firemen	...	4
			Cigar makers	...	4	Firewood cutter	...	1
			Clergymen	...	2	Fish curers	...	2
Bag maker	...	1	Clerks	...	80	Fisherman	...	1
Bailiff	...	1	Coach builder	...	1	Fishing-rod maker	...	1
Bakers	...	11	Coachmen	...	28	Fishmongers	...	15
Bandmaster	...	1	Cobbler	...	1	Fitter	...	1
Bargeman	...	1	Coffee-house keepers		2	Footmen	...	2
Bar keepers	...	5	Cokeman	...	1	French polishers	...	11
Barmen	...	17	Collar maker	...	1	Fretwork cutter	...	1
Basket makers	...	3	Collectors	...	2	Fruiterer	...	1
Bell hanger	...	1	Collier	...	1	Furrier	...	1
Belt maker	...	1	Commissionaires	...	2			
Billiard marker	...	1	Compositors	...	28			
Blacksmiths	...	9	Conductor	...	1			
Blanket maker	...	1	Confectioner	...	1	Gardeners	...	22
Blind maker	...	1	Contractors	...	2	Gas fitters	...	19
Block makers	...	2	Cooks	...	11	Gas stokers	...	3
Boat builders	...	2	Coopers	...	4	Gate keeper	...	1
Boatman	...	1	Coppersmith	...	1	General dealers	...	7
Boiler makers	...	2	Cordwainer	...	1	Gilders	...	4
Bookbinders	...	21	Cork cutter	...	1	Glass manufacturer	...	1
Boot clickers	...	8	Costermongers	...	29	Glaziers	...	4
Boot makers	...	27	Cow keepers	...	2	Goldsmith	...	1
Box makers	...	15	Curriers	...	4	Goldworkers	...	2
Brakesman	...	1				Grainers	...	2
Brass workers	...	4				Greengrocers	...	11
Brewers	...	4				Grocers	...	7
Bricklayers	...	36	Dairyman	...	1	Grooms	...	7
Broom makers	...	4	Decorators	...	2	Gunsmiths	...	3
Builders	...	2	Drapers	...	12	Gutta-percha man	...	1
Bus conductors	...	2	Draymen	...	6			
Butchers	...	17	Drivers	...	10			
Butlers	...	2	Druggists	...	2			
			Drug grinder	...	1	Hairdressers	...	7
			Dyer	...	1	Harness makers	...	6
						Hatters	...	6
						Hawkers	...	22
Cabinet makers	...	30				Hay binder	...	1
Cabmen	...	28	Electricians	...	2	Horse dealer	...	1
Cab washer	...	1	Electro-plater	...	1	Horse keepers	...	15
Candle maker	...	1	Embosser	...	1	Hosier	...	1
Caretakers	...	7	Engine cleaner	...	1	Housebreakers	...	5
Carmen	...	87	Engine drivers	...	5	Huntsman	...	1

OCCUPATIONS OF MALE PATIENTS *(continued)*.

Ice-cream vendors	...	3	Pastrycook	...	...	1	Stereotypers	...	...	2
Instrument makers	...	2	Paupers	...	...	2	Stevedores	...	...	4
Iron workers	...	...	5	Pawnbroker	...	...	1	Steward	...	...	1
				Pensioner	...	...	1	Stick makers	...	...	3
				Perforator	...	...	1	Stock keepers		...	5
				Pewterer	...	...	1	Stokers	...	...	41
Jewellers	...	...	2	Photographers		...	5	Students	...	...	37
Joiners	...	...	3	Plasterers	...	...	8	Stonemasons	...	...	4
Journalist	...	...	1	Platelayers	...	...	10	Surgeons	...	...	3
				Plumbers	...	...	22	Sweeps	...	...	4
				Policemen	...	...	11	Swordsman	...	...	1
				Polishers	...	...	19				
Knife cleaner	...	1		Porters	...	...	107				
				Postmen	...	...	12				
				Potmen	...	...	13				
				Potter	...	...	1				
Labourers	...	...	108	Printers	...	...	40	Tailors	...	...	10
Lead worker	...	...	1	Publicans	...	...	9	Tallow chandlers		...	2
Leather cutters	...	2		Pugilist	...	...	1	Tanner	...	...	1
Lecturer on Pathology		1						Telegraphist	...	...	1
Lithographer	...	...	1					Tie cutters	...	...	4
Looking-glass makers		3						Timber merchant		...	1
								Timekeeper	...	...	1
				Railway servants		...	13	Tin coopers	...	...	2
				Refiners	...	...	2	Tin platers	...	...	5
Machinists	...	...	6	Rivetter	...	...	1	Tobacconists	...	...	3
Maltster	...	...	1	Road sweeper		...	1	Tool maker	...	..	1
Manager	...	...	1					Toy makers	...	...	2
Masons	...	...	4					Travellers	...	...	9
Match makers	...	8						Turner	...	...	1
Mechanic	...	...	1					Type cutters	...	...	4
Medical practitioners		7		Saddler	...	...	1	Type founders		...	4
Merchants	...	...	3	Sail maker	...	...	1	Type writer	...	...	1
Messengers	...	...	26	Sailors	...	...	34				
Metal polisher	...	1		Salesmen	...	...	4				
Milkmen	...	...	2	Sandwich man		...	1				
Millers	...	...	2	Sawyers	...	...	6				
Miners	...	...	3	Scavengers	...	...	4	Umbrella makers		...	4
				School boys	...	...	320	Upholsterers		...	2
				Screw maker	...	...	1				
				Secretaries	...	...	2				
Newsagents	...	...	4	Servants	...	...	5				
Newsvendors	...	14		Shipwrights	...	...	2				
Night Watchman	...	1		Shop assistants		...	13				
				Shunters	...	...	3	Van boys	...	...	26
				Shoeblack	...	...	1	Van guards	...	...	3
				Shoemakers	...	...	7				
Office boys	...	...	2	Sign writers	...	...	2				
Organ builder	...	1		Silk trimmer	...	...	1				
Organ grinder	...	1		Silversmiths	...	...	2				
Ostlers	...	...	2	Slater	...	...	1	Waiters	...	...	4
				Slaughtermen		...	2	Warehousemen		..	22
				Soap maker	...	...	1	Watchmakers		...	2
				Soldiers	...	...	17	Watchmen	...	...	5
Packers	...	...	38	Solicitors	...	...	2	Waterman	...	...	1
Page	...	...	1	Spectacle maker		...	1	Wharfinger	...	...	1
Painters	...	...	52	Splint maker	...	...	1	Wheelwrights		...	2
Paper cutter	...	...	1	Stablemen	...	...	8	Window cleaner		...	1
Paper hanger	...	1		Stain maker	...	...	1	Wire workers	...	...	4
Paper miller	...	...	1	Stay presser	...	...	1	Wood cutters	...	...	5
Paper stainer	...	...	1	Stationers	...	...	5	Wood turner	...	...	1

OCCUPATIONS OF FEMALE PATIENTS.

Actress	...	1	Flower seller	...	1	Office cleaners	...	2
Artificial flower makers		4	French polisher	...	1			
			Fruit sellers	...	2			
			Furrier	...	1			
						Packer	...	1
						Paper bag maker	...	1
Bag makers	...	3				Paper folder	...	1
Barmaids	...	7				Paper sorter	...	1
Basket maker	..	1	Gaiter maker	...	1	Polishers	...	4
Book folders	...	11	Governesses	...	7			
Book sewers	...	4	Greengrocer	...	1			
Boot makers	...	4						
Bottle fillers	...	3				Rag sorters	...	2
Box makers	...	9						
			Hawker	...	1			
			Herbalist	...	1	School girls	...	206
			Housemaids	...	16	Scrubbers	...	2
Cashier	...	1	Housekeepers	...	15	Servants	...	182
Charwomen	...	15	Housewives	...	602	Shirt maker	...	1
Cigar makers	...	8				Shop girls	...	5
Cigarette maker	...	1				Shop keeper	...	1
Clerks	...	2				Silk weaver	...	1
Collar maker	...	1				Stamper	...	1
Confectioner	...	1	Indiarubberess	...	1	Straw plaiter	...	1
Cooks	...	24	Ironers	...	19	Stuffer	...	1
Corset makers	...	4						
Cotton winder	...	1						
						Tailoresses	...	18
			Lacquer worker	...	1	Teachers	...	11
			Landladies	...	2	Tent makers	...	2
Dairywomen	...	6	Laundresses	...	47	Tie makers	...	9
Drapers	...	3	Lodging-house keepers		2	Tobacconist	...	1
Dressmakers	...	43				Trimmers	...	4
						Type writers	...	3
			Machinists	...	24			
Envelope folders	...	2	Manageress	...	1	Umbrella maker	...	1
Errand girls	...	10	Mangler	...	1	Upholsterer	...	1
			Mantle makers	...	2			
			Milliners	...	2			
						Vellum sewers	...	2
Factory girls	...	13						
Fancy box makers	...	2						
Feather workers	...	4	Needlewomen	...	37			
Fish curer	...	1	Nursery maids	...	9	Waitresses	...	5
Flower makers	...	6	Nurses	...	60	Ward maids	...	29

MEDICAL REPORT.

PREFACE TO THE APPENDIX (MEDICAL TABLES).

In place of the partial and fragmentary Indices which were formerly appended to each Table, a complete Index of Medical Cases has been added, as was done last year, and an Index to the Medical Post-mortem Register, compiled by Dr. Tooth, has also been added.

References to the clinical reports are made as follows :—The name of a ward indicates the ward-book for the year (1894), while the Arabic numeral following indicates the number therein of the report in question.

The ward-books (bound volumes of clinical reports) and the completed post-mortem registers are kept in the Library.

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
GENERAL DISEASES,																																							
A.																																							
Febricula	14	9	5	...	...	2	2	...	...	3	1	...	...	...	1	...	...	2	1	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Measles	10	3	6	...	**1**	3	3	...	**1**	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scarlatina	4	3	1	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pertussis	13	7	4	**1**	**1**	6	4	**1**	**1**	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Typhoid Fever ...	128	77	31	**12**	**8**	...	1	**1**	...	8	2	...	...	20	6	**2**	**1**	11	4	**1**	**2**	18	10	**4**	**5**	15	6	**2**	...	5	2	**1**	...	...	...	**1**	...	...	...
Diphtheria	70	24	16	**17**	**13**	15	6	**16**	**9**	8	5	**1**	**3**	...	3	...	...	1	1	...	...	...	1	...	...	...	...	...	**1**	...	...	...	...	...	...	...	...	...	...
Influenza	11	7	4	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1	...	...	...	2	2	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...
Ague	9	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Choleraic Diarrhœa ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dysentery	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	...	...	...	...	...	...	...
Pyæmia	9	2	3	...	**4**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	**3**	1	1	...	**1**	...	...	...	...	1	...	...	1	...	...	...
Total	272	145	70	**30**	**27**	...	...	...	...	...	...	—	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
GENERAL DISEASES.																																							
B.																																							
Rheumatic Fever	38	23	15	...	...	...	...	...	...	1	...	...	...	2	2	...	...	7	3	...	...	8	4	...	...	4	6	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Rheumatism	39	16	22	1	...	...	1	...	...	2	1	...	...	2	1	...	...	4	6	1	...	6	9	...	...	2	3	...	...	...	1	...	...	...	...	...	...	...	...
Muscular	2	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Gonorrhœal	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Arthritis	3	...	2	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Osteo-arthritis	10	3	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	3	...	...	1	2	...	...	1	...	...	...	...	1	...	...	...	...	...
Gout...	7	5	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	1	1	...	...	...	1	...	...
Syphilis	5	1	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	2	...	...	...	...	1	...	...	...	...	...	...	1	...
Rickets	7	3	1	3	...	3	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tuberculosis	4	...	...	4	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Marasmus	11	1	3	4	3	...	3	4	3	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Enlarged Spleen	5	2	3	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Anæmia	43	2	41	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	12	...	...	1	23	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...
Perniciosa	7	3	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	1	...	...	2	...	...	1	...	...	...	...	...	...	...
Leucocythæmia	4	2	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...
Lymphadenoma	7	4	1	2	...	...	...	...	...	...	...	1	...	...	...	1	...	3	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Debility	20	5	15	...	...	...	...	...	...	1	1	...	...	1	1	...	...	...	1	...	...	...	8	...	...	1	2	...	...	...	2	...	...	...	...	...	...	2	...	...
Myxœdema	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...
Cretinism	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
GENERAL DISEASES, B. (*continued.*)																																							
Graves' Disease	9	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	1	...	...	...	1	...	...	...	3	...	...	...	...	...
Adenitis	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Immaturity	2	...	...	...	**2**	...	...	...	**2**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Obesity	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Immersion	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Œdema	2	1	...	...	**1**	...	...	...	...	...	...	...	...	...	...	**1**	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Malingering	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Total	234	76	130	**18**	**10**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F
LOCAL DISEASES.																																							
DISEASES OF THE NERVOUS SYSTEM.																																							
General.																																							
Insanity	8	4	4	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	...	...	1	...	...	...	1	1	...	...	...	1	...	...	1	...	...	...	...	...	...
General Paralysis	6	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	2	...	...	...	1	...	...	...	...	...	...
Paralysis Agitans	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Chorea	43	11	32	...	...	...	...	...	...	2	6	...	...	7	14	...	...	1	9	...	...	1	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Epilepsy	28	17	10	...	1	1	...	...	...	...	...	...	1	2	...	...	...	1	3	...	...	3	6	...	...	3	...	...	...	2	1	...	...	3	...	...	...	2	...	...
Convulsions ...	5	4	1	...	...	3	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Hysteria	8	3	5	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	2	...	...	1	...	...	...	1	1	...	...	...	1	...	...	...	...	...
Cranial.																																								
Meningitis	3	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Tubercular	16	...	...	10	6	...	...	6	3	...	...	2	3	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Septic	3	...	...	1	2	...	...	...	...	...	...	2	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hemiplegia	22	17	5	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	...	...	7	1	...	...	2	1	...	...	7	...	...
Congenital	3	3	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Headache	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Monoplegia	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Cerebral Aneurysm ...	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Hæmorrhage ...	5	...	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	2	...	...	1	...	...	...
Tumour	6	2	1	3	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Syphilis	9	7	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	5	2	...	...	1	...	...	...	...	...	...	...	...	...	...
Cerebellar Hæmorrhage ...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE NERVOUS SYSTEM (*continued*).																																							
Paralysis of Cranial Nerves	3	3	...	...	...									1				1								1														
Otitis	5	1	1	3	...							1		1	1	2																		2						
Vertigo	2	2	...	...	...																																			
Optic Neuritis	1	1	...	...	...									1																										
Spinal.																																							
Vertebral Caries	1	1	...	...	...													1																						
Paraplegia	2	...	2	...	...																					1				1										
Polio-myelitis	4	2	1	1	...	1	1															1																1		
Ataxic Paraplegia	3	3	...	...	...																									1				2						
Lateral Sclerosis	2	1	1	...	...																	1	1																	
Amyotrophic	2	1	1	...	...																									1				1						
Paraplegia, Functional	7	5	2	...	...	1								1								2	1							1				1						
Tabes Dorsalis	9	5	3	1	...																					1				1	1			3	2			1		
Multiple Sclerosis	6	3	2	...	1														1		1	1								2	1									
Syringo-myelia	1	1	...	...	...																	1																		
Ataxia	2	1	1	...	...						1																												1		

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE NERVOUS SYSTEM (*continued*.)																																							
Peripheral.																																							
Neuritis	12	5	5	...	**2**	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	1	1	...	**1**	2	2	...	**1**	...	...	...	...
Diphtheritic Paralysis ...	8	6	2	...	...	6	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Sciatica	4	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	1	...	...	...	...	...	...
Neuralgia	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...
Psuedo-hyertrophicParalysis	2	2	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other Paralyses	5	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	1	...	...	1	...	...	...	1	...	...	...	...	...	...
Myalgia	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	258	128	90	**24**	**16**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE I. (*continued*).

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE CIRCULATORY SYSTEM.																																							
Heart Disease	6	4	2	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	...	...	2	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Mitral	84	26	37	**9**	**12**	...	...	**1**	...	2	1	...	**1**	8	8	**1**	**2**	2	9	...	**5**	4	9	**2**	**2**	2	4	**1**	**2**	4	4	**2**	...	4	2	**2**	...	...	...	...	...
Aortic	26	16	4	**5**	**1**	...	...	...	...	...	...	...	...	1	2	...	...	2	1	...	...	5	1	**1**	**1**	2	..	**2**	...	3	..	**2**	...	2	...	...	...	1	...	...	...
Aortic and Mitral ...	32	16	6	**7**	**3**	...	...	...	...	2	1	...	**1**	1	...	**1**	...	3	...	...	**2**	3	1	**1**	...	2	1	**1**	...	4	2	**3**	...	...	1	**1**	...	1	...	...	...
Ulcerative Endocarditis...	4	...	...	**4**	...	...	..	**1**	...	...	...	...	...	...	...	...	...	...	**1**	...	...	...	**2**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dilatation	9	2	2	**3**	**2**	...	...	...	...	...	...	...	...	...	...	...	...	...	**1**	...	...	...	1	...	...	1	...	**1**	**2**	...	1	**1**	...	...	...	...	...	1	...	...	...
Congenital	7	6	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Fatty Degeneration ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Pericarditis	13	4	2	**1**	**6**	...	...	...	...	2	2	...	...	...	...	**3**	...	...	...	...	**2**	2	...	...	**1**	...	...	...	...	...	...	...	...	...	**1**	...	...	...	...	...
Aneurysm (Aortic) ...	9	6	...	**3**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	**1**	...	1	...	**1**	...	2	...	**1**	...	1	...	...	...
Arterial Sclerosis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Thrombosis	8	1	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	1	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...
Angina Pectoris	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Pulsating Aorta	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...
Vascular Abnormality ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	205	87	62	**32**	**24**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE I. (*continued*).

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE RESPIRATORY SYSTEM.																																									
Catarrh	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laryngismus	6	4	2	...	...	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laryngeal Obstruction ...	2	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Laryngitis	24	14	10	...	...	8	8	...	...	4	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Phlegmonous	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Syphilitic	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Stricture of Trachea ...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Bronchitis	43	20	17	3	3	10	5	3	3	1	1	...	...	...	1	...	...	1	...	...	...	2	2	...	...	3	4	...	...	2	2	...	...	1	2	...	...	...	...
And Emphysema ...	43	30	6	4	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	1	...	9	2	1	...	12	1	1	1	3	...	...	1	4	1	1	1
And Pleurisy	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Emphysema...	8	2	1	5	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	1	...	...	1	...	2	...
Asthma	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bronchiectasis	5	3	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pneumonia, Croupous ...	121	76	28	13	4	7	8	1	...	11	5	1	...	10	5	...	...	13	3	1	...	16	3	2	...	11	4	4	2	5	...	2	...	3	...	2	1	...	...	1
Catarrhal	59	20	28	8	3	12	21	7	3	2	3	1	...	4	2	...	...	2	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chronic	4	2	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...
Lung, Gangrene of... ...	2	...	1	1	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phthisis Pulmonalis ...	63	28	13	15	7	...	...	1	1	1	...	1	...	...	...	...	...	5	1	...	1	9	7	6	2	8	5	3	2	5	...	3	1	...	...	1	...	...	...
Pleurisy	10	7	3	...	...	...	1	...	...	...	1	...	...	2	1	...	...	...	...	...	...	2	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Pleuritic Effusion ...	51	39	12	...	...	1	...	...	...	3	...	...	...	2	3	...	...	5	1	...	...	10	3	...	...	11	2	...	...	5	1	...	...	2	2	...	...	...	...
Empyema	27	17	6	4	...	3	1	2	...	1	1	...	...	1	1	...	...	1	...	...	...	2	1	1	...	6	1	...	...	2	1	...	...	1	...	1	...	...	...
Hæmoptysis...	9	6	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	2	1	...	...	...	...	...	1	1	1	...	...	...	...
Cancer of Lung	5	1	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	1	1	...	...	...	...	...	1

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE RESPIRATORY SYSTEM (*continued*).																																							
Mediastinal Tumour ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Dyspnœa	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Pleurodynia	2	1	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pulmonary Collapse ...	2	...	1	**1**	...	...	...	**1**	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	496	278	136	**56**	**26**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE DIGESTIVE SYSTEM.																																							
Stomatitis	4	2	2	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Cancrum Oris	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Parotitis	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tonsillitis	29	13	16	...	...	3	1	...	...	...	...	...	...	1	...	...	...	...	4	...	...	7	9	...	...	1	1	...	...	1	1	...	...	...	...	...	...	...	...
Stricture of Œsophagus ...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	...	...	...
Cancer of Œsophagus ...	4	1	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	...	...	1	...
Gastralgia	14	3	11	...	...	...	...	...	...	...	1	...	...	1	1	...	...	...	...	...	...	...	6	...	...	...	...	...	...	1	2	...	...	1	1	...	...	...	...
Dyspepsia	18	3	15	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	4	...	...	1	4	...	...	...	1	...	...	...	3	...	...	...	2	...	2	...	...	...
Vomiting	4	2	2	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Gastritis	8	3	5	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	1	...	...	1	1	...	...	1	...	...	...	...	...	...
Dilated Stomach	9	3	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	2	1	...	...	1	2	...	...	...	...	...
Hæmatemesis	14	8	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	3	2	...	...	2	1	...	...	1	1	...	...	...	...	...	...	1	1	...	...
Gastric Ulcer	29	...	26	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...	13	...	1	...	5	...	1	...	...	1	...	...	1	...	...	...	...	...
Duodenal Ulcer	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Cancer of Stomach... ...	12	2	3	6	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	1	3	...	1	1	2	1	...	...
Gastro-enteritis	19	10	3	3	3	3	1	3	2	1	...	...	...	...	...	...	...	...	...	...	...	2	2	...	1	3	...	...	...	1	...	...	...	...	...	...	...	...	...
Enteritis	4	2	1	...	1	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tubercular	3	...	1	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intestinal Hæmorrhage ...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Ulcerative Colitis	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Cancer of Intestine ...	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...
Intestinal Obstruction ...	3	1	1	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Perityphlitis	30	18	7	4	1	...	...	...	...	2	1	...	...	1	1	3	...	4	3	...	1	8	2	1	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...
Peritonitis	8	4	3	...	1	...	...	...	...	...	...	...	...	...	1	...	...	3	...	...	...	1	1	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE DIGESTIVE SYSTEM (*continued*).																																							
Peritonitis, Purulent ...	3	1	1	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Chronic or Tubercular	12	6	2	3	1	2	...	1	...	1	1	1	...	2	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...
Peritoneal Abscess ...	4	2	1	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Cancer of Peritoneum	3	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...	...	...	...
Jaundice	9	3	5	...	1	...	2	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	1	1	...	...	1	...	...	...	...
Cirrhosis of Liver	23	10	8	3	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	..	...	...	2	3	...	2	3	4	3	...	2	1	...	...	...	...
Syphilitic of Liver	4	2	1	...	1	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Biliary Calculus	8	1	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	3	...	...	...	1	...	...	...	3	...	...	...	...
Perihepatitis	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	1	..	...	...	...	...	...
Hepatic Abscess	7	5	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...	1	...	...	2	...	1	...	...	...	...	...	...	...	...
Pylephlebitis	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cancer of Liver	9	...	3	2	4	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	...	1	...	...	1	1	...	1	...	1
Hydatid of Liver	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Cancer of Pancreas ...	5	1	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	2	...	1	1	...	...	...	...	...
Ascites	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Constipation	8	3	5	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	1	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Diarrhœa	8	4	4	...	...	3	...	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Colic	11	5	6	...	...	2	...	...	...	...	...	...	...	...	2	..	...	...	1	...	...	1	3	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Fœcal Impaction ...	4	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Abdominal Abscess ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Tumour	11	5	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	1	1	...	1	1	...	...	1	2	...	...	...	1	...	...
Pain	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	362	131	171	35	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE URINARY SYSTEM.																																							
Nephritis, Acute	12	7	3	**2**	...	2	...	...	...	...	...	...	...	1	...	...	...	1	2	...	...	1	1	...	...	2	...	**1**	...	...	...	...	...	...	**1**	...	...	...	...	...
Chronic...	63	33	17	**8**	**5**	...	1	...	...	2	...	...	...	...	1	...	...	5	1	**2**	...	8	2	**1**	**2**	9	4	**2**	**2**	3	7	**1**	...	4	1	...	**1**	2	...	**2**	...
Renal Calculus	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Caneer	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Abscess...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hæmaturia	8	7	...	**1**	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	**1**	...	2	...	...	...
Paroxysmal	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Suppression of Urine ...	2	1	...	...	**1**	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**1**	...	...	...	...	...	...	...	...	...	...	...	...
Diabetes Mellitus	23	16	5	**1**	**1**	2	...	**1**	...	...	...	...	...	...	...	...	...	2	...	...	**1**	5	2	...	...	2	...	...	...	2	...	...	...	3	2	...	...	...	1	...	...
Cystitis	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	115	67	29	**12**	**7**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE FEMALE GENERATIVE SYSTEM.																																							
Vulva, Hypertrophy of	2		2																									1				1							
Hæmatoma of	1		1																			1																	
Abscess of	1		1																							1													
Tumours of	4		4																			1				1				1				1					
Ruptured Perinæum	14		14															1				5				5				2						1			
Urethra, Prolapse of	2		2																							1				1									
Caruncle of	5		5																			1				1								3					
Cancer of	1		1																																			1		
Vagina, Hypertrophy of	1		1																							1													
Laceration of	3		3																			2				1													
Vaginitis	3		3																			1				1								1					
Cystocele	2		2																			1												1					
Recto-vaginal Fistula	2		2																			2																	
Cervix, Hypertrophy of	3		3																			1				1				1									
Inflammation of	9		9																			2				3				3				1					
Fibrous Tumour of	1				1																							1											
Cancer of	24		23		1																	1				9				8				5		1			
Uterus, Prolapse of	7		7																			1				3				3									
Ante-version of	1		1																							1													
Retro-version of	5		5																			3				2													

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE FEMALE GENERATIVE SYSTEM (*continued*).																																							
Uterus, Endo-metritis ...	8	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	5	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Peri-metritis	26	...	26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	16	...	...	...	7	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Perimetric Abscess ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Polypus of	5	...	4	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	3	...	...	...	...	...	...	...	...	...	...	1
Fibroid tumour of ...	32	...	28	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	...	...	...	12	...	1	...	...	...	2	...	1	...	1	...	...	...	...
Cancer of	3	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	...	...	...
Parametritis	5	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Parametric phlegmon....	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hæmorrhage	12	...	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	4	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...
Appendages. Inflamed ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hydro-salpinx	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Pyo-salpinx	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ovarian Tumour	36	...	33	...	3	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	13	...	...	...	7	...	1	...	7	...	1	...	4	...	...	...	...	...	1
Pelvic Pain	4	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Inflammation ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Abscess	4	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Hæmatoma	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hæmatocele	1	..	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tumour	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cancer	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE FEMALE GENERATIVE SYSTEM (*continued*).																																							
Dysmenorrhœa	8	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	5	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Menorrhagia	4	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leuconhœa	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	254	...	241	...	**13**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES CONNECTED WITH PREGNANCY OR PARTURITION.																																							
Pregnancy	8	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...
Labour	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...
Hæmorrhage, Accidental ...	5	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	2	...	...	...	...	...	...	...	...	...
After Abortion	8	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	6	...	...	...	1	...	...	...	...	...	...	...	...	...
Post-partum	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Abortion	14	...	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	8	...	...	...	2	...	...	...	...	...	...	...	...	...
Hydramnios...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Placenta retained	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tubal Cystation	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Puerperal Convulsions ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Albuminuria	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Contracted Pelvis	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	50	...	50	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE CUTANEOUS SYSTEM.																																							
Erysipelas	8	1	6	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1	3	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
Eczema	6	2	4	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...
Dermatitis Bullora.. ...	2	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Herpetiformis	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erythema	3	1	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peliosis Rheumatica ...	2	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Purpura	5	1	3	...	1	...	...	...	...	1	...	...	1	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lupus	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Herpes	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	30	10	18	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
POISONS.																																								
Alcohol	3	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Lead	13	8	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	4	1	1	...	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Mercury	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Aconite	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Ammonia	2	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arsenic	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Belladonna	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Carbolic Acid	5	3	1	1	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Opium	3	2	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Hydrochloric Acid	2	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nitric Acid	2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Oxalic Acid	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	37	22	11	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

ABSTRACT OF TABLE I.

DISEASES.	Total Number of Cases completed during the Year 1894.	Number of Cases discharged.		Deaths.		Remaining in the Hospital at the end of the Year 1894.
		M.	F.	M.	F.	
GENERAL DISEASES, A	272	145	70	**30**	**27**	
Do. Do. B	234	76	130	**18**	**10**	
LOCAL DISEASES—						
Diseases of the Nervous System	258	128	90	**24**	**16**	
„ „ Circulatory System	205	87	62	**32**	**24**	
„ „ Respiratory System...	496	278	136	**56**	**26**	
„ „ Digestive System	362	131	171	**35**	**25**	
„ „ Urinary System	115	67	29	**12**	**7**	
„ „ Female Generative System	254	...	241	...	**13**	
„ connected with Pregnancy...	50	...	50	...	...	
„ of the Cutaneous System	30	10	18	...	**2**	
CONDITIONS NOT NECESSARILY ASSOCIATED WITH GENERAL OR LOCAL DISEASES—						
POISONS	37	22	11	**4**	...	
	2,313	944	1,008	**211**	**150**	210
		1,952		**361**		
		2,313				

INDEX

TO THE DISEASES AND CHIEF SYMPTOMS OF PATIENTS DISCHARGED FROM THE MEDICAL WARDS DURING THE YEAR 1894.

N.B.—The mark (†) signifies that a case terminated fatally; (‡) that a post-mortem examination was made. The reference to the post-mortem notes, together with an abstract of these, is in each case added to the Ward notes.

INDEX

TO REGISTER OF POST-MORTEM EXAMINATIONS.

MEDICAL, Vol. XXI., 1894,

BY H. H. TOOTH, M.D. (CANTAB.), F.R.C.P.

SURGICAL REPORT.

PREFACE TO THE SURGICAL REPORT.

The Appendices to Tables I. and II. have this year been considerably enlarged in the hope that they may become of more practical use. Short notes of all the more important cases, especially the operation cases, have been given. A full Index of all pathological lesions found at the Post-mortem Examinations has been added for the first time.

TABLE I.

Showing the Total Number of Cases under Treatment during the Year 1894, *with the comparative Frequency and Mortality of each Disease at different Ages.*

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F
DISEASES.																																							
GENERAL DISEASES.																																							
Acromegaly	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Anthrax	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erysipelas—																																							
Cutaneous	49	20	28	...	1	4	2	...	1	2	3	...	...	1	2	...	...	1	2	...	...	6	5	...	...	2	5	...	...	2	4	...	...	1	4	...	...	1	1	...	...
Phlegmonous Erysipelas and Cellulitis ...	105	73	24	7	1	7	...	2	...	2	2	...	...	5	1	...	...	4	3	...	...	17	2	...	...	13	2	...	...	15	8	3	...	10	3	...	...	...	3	2	1
Gangrene—																																							
Idiopathic	5	1	1	1	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	...	1
Traumatic	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hæmophilia...	6	6	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Hæmorrhage	5	4	1	...	...	...	1	...	...	1	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lardaceous Disease ...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Septicæmia and Pyæmia ...	6	3	...	1	2	...	...	...	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Parasites—																																									
Hydatids	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

TABLE I. (*continued*).

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
VENEREAL DISEASES.																																							
Gonorrhœa	37	33	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	1	...	...	18	1	...	...	7	1	...	...	2	1	...	...	...	...	...	...	...	...	...	...
Constitutional Syphilis—																																								
Primary...	14	2	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	2	6	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Secondary	61	25	36	...	...	...	...	...	...	...	1	...	...	...	1	...	...	6	10	...	...	14	20	...	...	3	4	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Tertiary...	27	15	12	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	...	...	4	10	...	...	4	...	...	...	2	...	...	...	1	...	...	...
Congenital Syphilis ...	9	...	8	...	**1**	...	4	...	**1**	...	...	...	...	...	1	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Local Syphilis	14	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	6	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phagedœna	5	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	1	...	...	2	...	...	...	...	...	...	...	...	...	...
TUMOURS.																																								
Epithelioma—																																								
Anus	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Bladder	1	...	...	**1**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**1**	...
Cheek	7	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	4	...	...	...	2	...	...
Floor of Mouth... ...	4	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	1	...
Glands of Axilla ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Glands of Groin ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...
Glands of Neck ...	12	11	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	3	...	...	...	5	...	...	...	2	...	...
Hand	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...
Jaw (Upper)	6	5	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	4	1	...	...	...	...	...
Jaw (Lower)	5	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	3	...	...
Larynx	8	5	...	**3**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	**1**	...	4	...	**2**	...	...	...	...	...
Leg	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Lip	9	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	6	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
TUMOURS (*continued.*)																																							
Epithelioma (*continued*)—																																							
Neck	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Œsophagus	9	7	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	1	...	3	...	1	...
Palate	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	2	...	...	...	1	...	...	...
Penis	8	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	3	...	...	...	2	...	...	...
Pharynx	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Scrotum	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	2	...	...	...	1	...	...	...
Tongue	27	22	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	4	...	1	11	...	1	...	7	...	2	...
Tonsil	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	1	...	...	...	...	...	...
Trachea	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Vulva	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...
Rodent Ulcer—																																							
Face	10	6	3	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	3	3	1	...
Alveolar Carcinoma—																																							
Breast	72	...	69	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	6	...	1	...	30	...	1	...	22	...	...	...	10	...	1
Breast (recurrent) ...	11	...	10	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	4	...	1	...	1	...	...
Glands of Axilla ...	4	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	1	...	...	...
Glands of Groin ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Intestine	6	...	1	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	...	...	...	2	1	...	...	...	...	...	...	...	...
Pancreas	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Prostate	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Rectum	35	20	13	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	5	...	...	5	3	...	...	3	7	1	...	5	3	1	...
Stomach	5	2	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	2	...	1	...

TABLE I. (*continued*).

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F
TUMOURS (*continued.*)																																							
Sarcoma—																																							
Abdominal Wall ...	1	...	1	...	...																					1													
Axilla	2	2	...	...	...																					1										1			
Back	2	2	...	...	...																	1				1													
Bone—																																							
Femur...	4	1	1	1	1															1			1			1				1									
Humerus	1	...	1	...	...																													1					
Ilium	2	1	1	...	...													1								1													
Jaw	3	2	1	...	...														1			1											1						
Tibia	1	...	1	...	...														1																				
Brain	1	...	...	...	1																							1											
Breast	4	...	4	...	...																					1			2							1			
Cheek	5	3	2	...	...																															3	2		
Chest Wall	2	1	1	...	...																		1			1													
Glands of Neck ...	3	1	1	1	...																								1					1				1	
Glands (Lumbar) ...	1	1	...	...	...																					1													
Groin	1	1	...	...	...																															1			
Kidney	2	2	...	...	...																															2			
Muscle	3	2	1	...	...													1					1			1													
Neck	1	...	...	1	...			1																															
Popliteal Nerve ...	1	...	1	...	...														1																				
Parotid	4	1	3	...	...																													3				1	
Pharynx	2	2	...	...	...																	1				1													
Retro-peritoneal ...	1	...	1	...	...																													1					
Testis	7	6	...	1	...	1												1					1			2				2								
Thigh	1	...	1	...	...																													1					

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
TUMOURS (*continued*.)																																							
Sarcoma (*continued*)—																																							
Tonsil	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Uterus	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Lympho-sarcoma	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Cysts—																																							
Breast	9	1	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	6	...	...	...	1	1	...	...	...	...
Dental	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dermoid...	11	4	7	...	...	...	2	...	...	3	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	2	...	...	...	...	...	...	1	...	...	...
Hygroma	8	4	4	...	...	3	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mucous	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ovarian	4	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Sebaceous	7	2	5	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	1	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...
Serous (*of Neck*) ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Sero-cystic Tumour of Breast ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Synovial...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Abdominal Tumour ...	9	...	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	2	...	...	...	3	...	...	...	...	...	...
Adeno-Chondro Fibroma—																																							
Parotid	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Submaxillary	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Adeno-Fibroma—																																							
Breast	13	...	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	5	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Parotid	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
TUMOURS (*continued.*)																																							
Adenoma—																																							
Palate	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Angeio Fibroma—																																							
Naso-Pharyngeal ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Enchondroma—																																							
Finger	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Submaxillary Gland ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Exostosis—																																							
External Auditory Meatus	2	1	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Femur	4	3	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Humerus	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jaw (Lower)	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Multiple... ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phalanx...	3	1	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Fibroma—																																							
Arm	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Back	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Chest Wall	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Jaw	6	2	4	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	1	...	...	2	...	...	...	...	...	...	...	...	...
Knee	2	...	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Larynx	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Shoulder...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Fibro-Myoma—																																							
Uterus	3	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
TUMOURS (*continued.*)																																							
Keratoma—																																							
Penis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lipoma—																																							
Arm	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Back	4	3	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Neck	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shoulder	5	1	4	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	1	2	...	...	...	...	...	...	...	...	...
Thigh	6	1	5	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...
Lymphadenoma	9	7	1	**1**	...	...	...	...	...	2	1	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	**1**	...
Lymphangioma—																																							
Tongue	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nævus	17	5	12	...	...	2	9	...	...	1	...	...	...	...	...	...	...	1	...	...	...	2	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Neuro-Fibroma	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Papilloma—																																							
Bladder	3	1	...	**2**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	**1**	...	...	...	**1**	...
Cheek	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...
Eyelid	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Finger	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Foot	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Larynx	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Leg	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Penis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Rectum	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tongue	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	1	...	...
Umbilicus	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
TUMOURS (*continued.*)																																							
Polypus—																																							
Nose	6	1	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	2	...	...	...	...	...	...	2	...	...	...	...	...	...	...
Rectum	5	2	3	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thyroid—																																							
Bronchocele	11	3	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	3	...	...	...	...	...	...	5	...	...	...	...	...	1	...	...	...
MALFORMATIONS AND DEFORMITIES.																																							
Anus, Imperforate	4	...	4	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cleft Palate...	23	12	11	...	...	3	1	...	...	8	4	...	...	1	2	...	...	...	3	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Congenital Cephalhæmatoma	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Congenital Cyst of Rectum	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Congenital Dislocation of Hip	6	1	5	...	...	...	2	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Congenital Malformation of—																																							
Rib	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scapula	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Toes	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
MALFORMATIONS AND DEFORMITIES (*continued*.)																																							
Contraction of—																																							
Elbow	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Finger	8	2	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	3	...	...	3	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Knee	2	1	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wrist	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Extroversion of Bladder ...	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Genu Retrorsum	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Genu Valgum	13	6	7	...	...	3	2	...	...	1	1	...	...	1	2	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Genu Varum	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hallux Valgus	5	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hammer Toe	13	8	5	...	...	...	...	...	...	...	...	...	...	1	...	...	...	3	1	...	...	3	2	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Hare Lip	26	20	6	...	...	19	6	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hypospadias	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phimosis	8	8	...	...	...	3	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rickety Curvature of—																																							
Femur	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia	11	5	6	...	...	3	5	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Spina Bifida...	2	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Spine, Lateral Curvature ...	2	...	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Supernumerary Thumb ...	1	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
MALFORMATIONS AND DEFORMITIES (*continued*.)																																							
Talipes—																																							
Calcaneo-Valgus ...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Equino-Varus	11	5	6	...	...	3	...	...	...	2	...	...	...	3	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Equinus	3	1	2	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Planus	6	5	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	3	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Valgus	5	5	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Varus	3	1	2	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Vagina Imperforate ...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vesico-Intestinal Fistula ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Webbed Fingers	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wry Neck	11	4	7	...	...	1	...	...	...	2	1	...	...	1	3	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE NERVOUS SYSTEM.																																							
Cerebral Syphilis	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Epilepsy	9	8	1	...	...	...	...	...	...	1	...	...	...	3	...	...	...	1	...	...	...	2	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...
Hemiplegia	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Hysteria	5	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Insanity	2	1	1	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Malingering...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meningitis	2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Neuralgia	5	3	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	1	...	...	1	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F
DISEASES OF THE NERVOUS SYSTEM (*continued.*)																																							
Paralysis—																																							
Infantile	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Oculo-motor	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Paraplegia	3	2	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tubercular disease of Spinal Membranes	1	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE EYE.																																							
Conjunctiva—																																							
Conjunctivitis	32	16	16	...	...	6	1	...	...	4	...	...	...	...	5	...	...	1	3	...	...	2	3	...	...	...	1	...	...	3	2	...	...	...	1	...	...	...	...	...
Episcleritis	7	2	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1	1	...	...	1	1	...	...	...	1	...	...	...	...	...	...	...	...
Herpes	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pterygium	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Purulent Ophthalmia ...	4	3	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...
Cornea and Sclerotic—																																							
Conical Cornea ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Keratitis	80	28	52	...	...	3	12	...	...	4	10	...	...	4	6	...	...	3	5	...	...	7	2	...	...	2	4	...	...	1	7	...	...	3	2	...	...	1	4	...	...
Interstitial Keratitis ...	7	5	1	...	...	...	...	...	...	1	...	...	...	3	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leucoma	3	1	2	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Staphyloma	7	4	3	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	1	...	...	...
Ulcer	33	29	4	...	...	5	1	...	...	7	2	...	...	5	...	...	...	2	...	...	...	3	...	...	...	1	1	...	...	3	...	...	...	2	...	...	...	1	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE EYE (*continued.*)																																							
Iris—																																							
Atresia Iridis	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hyphæmia	5	5	...	...	...	1	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Iritis	20	9	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	3	...	...	4	2	...	...	...	2	...	...	2	3	...	...	2	1	...	...
Irido-Cyclitis	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Kerato-Iritis	5	3	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	2	...	...	...
Lens—																																							
Aphakia...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Capsular Opacities ...	16	5	11	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	2	1	...	...	3	6	...	...
Cataract(anteriorpolar)	6	2	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	2	...	...
„ (*hard*) ...	54	24	29	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	...	...	5	4	...	...	18	23	...	1
„ (*soft*)	7	6	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...
„ (*traumatic*) ...	3	2	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Retina, Optic Nerve, and Vitrous Humour—																																							
Detached Retina ...	2	1	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intraocular Hæmorrhage	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Optic Atrophy	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ *Neuritis*	3	2	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Retinitis...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE EYE (*continued.*)																																							
Choroid—																																							
Choroiditis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Choroido-Retinitis ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Choroidal Ischæmia ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Melanotic Sarcoma ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
General Affections of the Eye—																																							
Amaurosis	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...
Amblyopia	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Atrophied Globe ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Exophthalmos	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Glaucoma	19	4	15	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	4	...	...	...	3	...	...	1	3	...	...	2	5	...	...
Panophthalmia... ...	7	6	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	2	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...
Sympathetic Irritation	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Squint—																																							
External	3	3	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Internal...	30	13	17	...	...	...	...	...	...	3	7	...	...	5	5	...	...	2	5	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Errors of Refraction—																																							
Astigmatism	8	2	6	...	...	...	...	...	...	1	3	...	...	1	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hypermetropia	11	4	7	...	...	...	...	...	...	1	1	...	...	2	4	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Myopia	2	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE EYE (*continued.*)																																							
Diseases of the Lacrymal Apparatus—																																							
Abscess	13	3	10	...	...	...	1	...	...	...	2	...	...	...	1	...	...	1	...	...	...	2	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...
Obstruction	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Diseases of the Eyelids—																																							
Blepharitis	8	4	4	...	...	...	...	...	...	2	2	...	...	2	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chancre on Eyelid ...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Entropion	8	3	5	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	1	1	...	...	...	1	...	...	1	...	...
Gumma of Lid... ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Meibomian Cyst ...	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rodent Ulcer	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...
Symblepharon	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Stump	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Ptosis	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE EAR.																																							
Otitis Media	41	22	14	**4**	**1**	2	2	...	...	2	4	**1**	...	3	3	...	**1**	8	...	...	...	5	4	**1**	...	...	1	**2**	...	1	...	...	...	1	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE NOSE AND THE ANTRUM.																																							
Nose—																																							
Epistaxis	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...
Septum Deviated ...	7	4	3	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	1	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Stenosis of Anterior Nares	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Syphilitic Ulceration ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Antrum—																																								
Empyema of	6	3	2	1	...	...	...	...	...	1	...	...	...	...	...	1	...	...	1	...	...	...	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE LARYNX AND TRACHEA.																																							
Foreign Body in Larynx	2	1	...	1	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Laryngeal Paralysis ...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...
Laryngitis (Chronic) ...	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...
Syphilitic Disease	2	1	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tubercular Disease... ...	4	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE THYROID GLAND.																																							
Cretinism	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Exophthalmic Goître ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE CHEST.																																							
Empyema	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Old Empyema	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE VASCULAR SYSTEM.																																							
Aneurysm—																																							
Aortic	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...
Cirsoid, of Hand ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Popliteal	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Raynaud's Disease	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Veins—																																							
Phlebitis and Thrombosis...	20	9	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	4	...	...	3	2	...	...	2	4	...	...	2	...	...	...	1	...	...	...
Varicose Veins	51	37	14	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...	20	10	...	...	3	3	...	...	6	1	...	...	...	...	...	...	1	...	...	...
Venous Aneurysm of Neck	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE LYMPHATIC SYSTEM.																																							
Lymphatic Glands—																																							
Inflamed and Suppurating	20	13	7	...	...	1	2	...	...	2	2	...	...	2	...	...	...	1	1	...	...	3	...	...	...	2	1	...	...	1	...	...	...	1	1	...	...	...	...	...	...
Tubercular	60	26	34	...	...	1	...	...	...	5	3	...	...	3	6	...	...	5	8	...	...	9	11	...	...	...	5	...	...	2	...	...	...	1	1	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE LYMPHATIC SYSTEM (*continued.*)																																							
Lymphatics—																																							
Lymphangitis—																																							
Arm	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Leg	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Spurious Elephantiasis—																																							
Leg	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE DIGESTIVE SYSTEM.																																							
Mouth—																																							
Buccal Fistula	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Cancrum Oris	2	1	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Stomatitis	4	2	1	...	1	1	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tongue—																																								
Dental Ulcer	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Tonsils—																																								
Enlarged	9	3	6	...	...	...	1	...	...	2	...	...	...	1	1	...	...	2	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Salivary Glands—																																								
Salivary Calculus ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE DIGESTIVE SYSTEM (*continued.*)																																							
Pharynx—																																							
Adenoid Vegetations ...	34	19	15	...	...	2	1	...	...	12	6	...	...	3	4	...	...	1	3	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Granular Pharyngitis ...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Œsophagus—																																							
Stricture	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Stomach—																																							
Gastritis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Liver, Gall Bladder and Ducts—																																							
Hepatic Abscess ...	2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dilatation of Gall Bladder	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Intestines—																																							
Hernia—																																							
Reducible—																																							
Femoral	11	1	9	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	2	...	...	...	3	...	...	...	3	...	...	...	1	...	...	...	1	...
Inguinal	97	87	9	1	...	6	...	...	...	5	...	1	...	5	1	...	...	26	2	...	...	20	6	...	...	8	...	...	...	9	...	...	...	3	...	...	...	5	...
Umbilical	3	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Ventral	8	1	7	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	2	...	...	...	1	...	...	1	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE DIGESTIVE SYSTEM (*continued*.)																																							
Intestines (*continued*)—																																							
Hernia (*continued*)—																																							
Irreducible—																																							
Femoral	9	2	7	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	3	...	...	...	3	...	...	...	1	...	...	...	...	...	...	...	...	...
Inguinal—	12	9	2	**1**	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	3	1	...	...	1	...	...	...	...	...	2	...	**1**	...
Umbilical	4	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**1**	**1**	...	...	...	...	...	**1**	...	...
Ventral	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**1**	**1**	...	...	...	...
Strangulated—																																								
Femoral	16	1	7	**1**	**7**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	3	...	**3**	1	2	...	...	1	**1**	**4**		
Inguinal	25	21	1	**3**	...	2	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	3	1	...	...	4	...	**1**	...	2	...	...	...	4	...	**1**	...	2	...	**1**	...
Umbilical	4	...	3	**1**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	**1**	...	...	...	2	...	...	...	...
Hydrocele of Hernial Sac...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...
Old Radical Cure of Hernia	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fœcal Fistula	6	2	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	1	1	...	...	...	...	...	...	1	...	...	...	1	...	...
Intestinal Obstruction—																																							
Acute	3	...	...	...	**3**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**3**	...	...	...	...	...	...	...	...	...	...	...
Chronic	4	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	...	...	...	...
Intus-susception	6	3	2	**1**	...	2	2	**1**	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Old Abdominal Section for Intus-susception ...	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Colic	3	3	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Enteritis	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE DIGESTIVE SYSTEM (*continued.*)																																							
Intestines (*continued*)—																																							
Perforating Ulcer of Duodenum	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Perityphlitis and Appendicitis	11	9	...	1	1	...	...	...	...	2	...	...	...	1	...	1	1	...	...	...	...	3	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...
Peritonitis	7	2	3	1	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	1	1	...	1	...	...	1	...	...	...
Rectum and Anus—																																							
Anal Fissure	7	2	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	2	...	...	1	2	...	...	...	...	...	...	...	...
Anal Ulcer	4	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Fistula-in-Ano	45	37	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	9	2	...	...	10	3	...	...	10	2	...	...	6	...	...	...	2	...	...	...
Hæmorrhoids	57	34	23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	4	1	...	...	4	17	...	...	16	2	...	...	8	1	...	...	2	1	...	...
Prolapse	10	5	4	1	...	3	1	...	...	...	...	...	...	1	...	...	...	3	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Stricture (*Fibrous*) ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Ulcer of Rectum (*Simple*)	4	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
(*Tubercular*)... ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE GENITO-URINARY ORGANS.																																							
Bladder—																																							
Calculus...	10	8	1	1	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	2	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	2	...	1	...
Cystitis	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	...	...
Foreign Body in ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tubercular Disease ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE GENITO-URINARY ORGANS (*contd.*)																																							
Kidney—																																							
Calculus	7	4	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	1	1	...	...	1	...	...	...	...	...	...
Hydronephrosis ...	2	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moveable Kidney ...	10	1	9	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	5	...	...	...	2	...	...	...	1	...	...	...	1	...	...	...	...	...
Renal Colic	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	...	...	...	...	...	...
Tubercular Disease ...	8	1	6	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	1	...	...	...	3	1	...	...	1	...	...	...	...	...	...	...	...	...
Old Nephrectomy ...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Prostate—																																								
Enlarged	9	5	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	4	...	3	...
Inflamed	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Spermatic Cord—																																								
Encysted Hydrocele ...	3	3	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Varicocele	33	33	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	18	...	...	...	14	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tunica Vaginalis—																																								
Hæmatocele	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hydrocele	24	24	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	5	...	...	...	4	...	...	...	4	...	...	...	5	...	...	...	3	...	...	...	1	...	...
Testis—																																								
Encysted Hydrocele ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Orchitis and Epididymitis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE GENITO-URINARY ORGANS (*contd.*)																																							
Testis (*continued*)—																																							
Retained Testis ...	8	8	...	...	...	...	...	...	...	1	...	...	...	3	...	...	...	3	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Syphilitic Disease ...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Tubercular Disease ...	15	15	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	6	...	...	...	3	...	...	...	3	...	...	...	...	...	...	...	...	...
Urethra—																																							
Calculus	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Caruncle	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Fistula	6	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...
Foreign Body in ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Stricture	76	68	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	23	...	2	...	20	...	4	...	16	...	1	...	5	...	1	...
Urine and Urination—																																							
Dysuria	3	2	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Extravasation	4	3	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	1	...	...
Hæmaturia	17	16	1	...	...	2	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	5	...	...	...	1	...	...	...	3	...	...	1	1	...	...	...	1	...	...	...
Incontinence	2	1	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Retention	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Suppression	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Uterus and Appendages—																																							
Parametritis	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F
DISEASES OF THE GENITO-URINARY ORGANS (*contd.*)																																							
Vulva and Vagina—																																							
Foreign Body	1	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Noma	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Prolapse of Vagina ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Ruptured Perineum ...	4	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Vaginitis	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Vesico-Vaginal Fistula	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Breast—																																								
Chronic Inflammation...	5	1	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...
Tubercular Disease ...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Old Amputation of Breast...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...
DISEASES OF THE ORGANS OF LOCOMOTION.																																							
Bone; Diseases of—																																							
Caries—																																							
Clavicle	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fibula.....	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Finger	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Frontal	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ilium	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jaw (Lower)	2	2	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ *(Upper)*	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE ORGANS OF LOCOMOTION (*continued.*)																																							
Bone: Diseases of (*contd.*)—																																							
Caries (*continued*)—																																							
Malar	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Metatarsus	5	2	3	...	...	1	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Os Calcis	2	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Spine	59	35	21	1	2	9	1	...	1	6	7	...	...	6	5	...	...	5	2	...	...	5	1	...	...	1	4	1	...	1	...	...	...	2	...	...	1	...	...
Sternum	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tarsus	6	3	3	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
Tibia	4	3	1	...	...	1	...	...	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Necrosis—																																								
Femur	13	8	2	1	2	...	...	1	...	...	...	...	...	5	...	...	...	3	2	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Humerus	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jaw Bones	13	5	6	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	1	3	...	...	3	2	...	...	1	...	...	...	...	...
Pelvis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phalanx	4	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	1	...	...
Radius	3	2	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia	8	6	2	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	1	...	...	1	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Turbinated	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Ulna	2	2	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Periostitis and Osteitis—																																								
(Acute)—																																								
Femur	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE ORGANS OF LOCOMOTION (*continued.*)																																							
Bone: Diseases of (*contd.*)																																							
Periostitis and Osteitis (*continued*)—																																							
(Chronic)—																																							
Clavicle	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Femur	6	6	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...
Fibula	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Humerus	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Jaw Bones	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Radius	2	...	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sternum	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia	8	4	4	...	...	...	1	...	...	...	1	...	...	1	...	...	...	1	...	...	...	2	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
Epiphysitis—																																								
Femur	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Stumps	15	15	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	3	...	...	...	3	...	...	...	2	...	...	...	4	...	...	...	1	...	...	...	...	...
Joints:																																								
Ankylosis—																																							
Ankle	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Elbow	4	1	3	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hip	11	5	6	...	...	...	...	...	...	1	2	...	...	2	2	...	...	1	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jaw	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Knee	7	5	2	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	2	...	...	...	...	...	...	1	...	...	...	...	...	...
Radio-ulnar Joint (upper)	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shoulder	4	4	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...
Many Joints	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE ORGANS OF LOCOMOTION (*continued.*)																																							
Joints (*continued*)—																																							
Charcot's Disease—																																							
Hip	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Knee	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	3	...	...	...	...	...	...	...
Ankle	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Tuberculous Disease—																																							
Ankle	13	8	5	...	...	1	...	...	...	3	2	...	...	1	...	...	...	1	...	...	...	...	2	...	...	1	1	...	...	1	...	...	...	...	...	...	...	1	1	...	...
Elbow	12	7	5	...	...	...	...	...	...	2	...	...	...	1	2	...	...	...	1	...	...	1	...	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Hip	79	46	30	3	...	2	2	1	...	16	10	...	...	3	7	...	...	13	6	...	...	9	3	1	...	1	2	...	...	...	...	1	...	...	...	...	...	2	...	...	...
Knee	66	37	29	...	...	6	3	...	...	6	6	...	...	3	5	...	...	4	6	...	...	6	5	...	...	8	3	...	...	3	...	...	...	1	...	...	...	...	1	...	...
Sacro-Iliac	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shoulder... ...	3	2	1	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wrist	7	6	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	...	...	2	...	...	...	1	1	...	...	...	...	...	...
Gonorrhœal Arthritis ...	6	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gouty Arthritis	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Hydrops Articuli	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Loose bodies in Joints—																																									
Knee	3	3	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Acute Rheumatic Arthritis—																																									
Hip	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE ORGANS OF LOCOMOTION (*continued*.)																																							
Joints (*continued*)—																																							
Osteo-Arthritis—																																							
Crico-thyroid Joint ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Elbow	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Hip	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	2	...	...	...
Knee	8	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	2	...	...	...	2	...	...	1	...	...	...	1	...	...
Many Joints	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Wrist	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Synovitis—																																							
Ankle	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Elbow	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Knee	16	14	2	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	6	...	...	...	3	...	...	...	2	1	...	...	1	...	...	...	...	...	...
Syphilitic Disease—																																							
Spine	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Suppurative Arthritis—																																							
Ankle	1	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Finger	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Knee	8	5	2	1	...	1	2	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Shoulder	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE ORGANS OF LOCOMOTION (*continued.*)																																							
Joints (*continued*)—																																							
Old Excisions—																																							
Hip	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Knee	7	4	3	...	...	...	...	...	...	...	1	...	...	3	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Astragalus	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Old Osteotomy—																																								
Femur	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fibula	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF BURSÆ, FASCIÆ AND TENDONS.																																							
Inflamed and Suppurating Bursæ—																																								
Olecranon	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...
Patellar	35	7	28	...	...	...	1	...	...	...	...	...	...	1	1	...	...	...	7	...	...	2	10	...	...	2	6	...	...	2	...	...	2	1	...	...	...	...	...
Over Great Toe ...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Under Tendo Achillis ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Simple Enlargement of Bursæ—																																								
Gluteal	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patellar	9	...	8	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	1	...	...	...	2	1	...	...	...	...	...	...	...
Popliteal	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF BURSÆ, FASCIÆ AND TENDONS (*continued*.)																																							
Ganglia—																																							
Simple	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Compound	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...
Dupuytren's Contraction of Palmar Fascia ...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...
Tubercular Disease of Tendon Sheaths ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
DISEASES OF THE CELLULAR TISSUE.																																							
Abscess, Inflammation and Suppuration	227	137	89	1	...	16	10	1	...	14	7	...	...	12	7	...	...	16	8	...	...	25	24	...	...	28	21	...	...	14	8	...	...	10	1	...	...	2	3	...	...
DISEASES OF THE CUTANEOUS SYSTEM.																																							
Carbuncle	12	9	3	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	2	...	...	2	...	...	...	1	...	...	...	3	...	...	...	2	1	...	...
Dermatitis Exfoliativa ...	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Eczema	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...
Favus	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Faruncle	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE CUTANEOUS SYSTEM (*continued*.)																																							
Impetigo Gangrenosum ...	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lichen Planus Ruber ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Purpura	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sycosis	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Tanthelasma Tuberosum ...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sinuses	28	13	14	1	...	...	...	...	...	...	1	...	...	...	...	...	...	5	1	...	...	7	3	1	...	1	2	...	...	...	6	...	...	...	1	...	...	...	...	...
Lupus—																																								
Face	19	4	15	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	5	...	...	...	6	...	...	1	1	...	...	...	1	...	...	1	...	...	...	...	1	...
Trunk	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Upper Extremity ...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Lower Extremity ...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lupus Erythematosus ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Nails—																																								
Ingrowing Toe-nail ...	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scars—																																								
Contracted	5	...	5	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Painful	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Ulcers—																																								
Chronic and Varicose ...	11	6	5	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	1	...	...	...	3	...	...	...	1	...	...	2	...	...	...	1	...	...	...	...	...	...
Perforating	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	...	...	...
Simple	3	3	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...

DISEASE.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
DISEASES OF THE CUTANEOUS SYSTEM (*continued*.)																																							
Ulcers (*continued*)—																																							
Strumous	6	4	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Syphilitic	7	2	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	3	...	...	...	1	...	...	...	1	...	...	...	...	...
Mole (Hairy)	5	...	5	...	...	...	1	...	...	...	3	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
INJURIES.																																								
Burns	31	11	13	**2**	**5**	5	6	**1**	**2**	...	2	...	...	2	1	...	...	1	1	**1**	**1**	...	2	...	...	1	...	...	**1**	2	...	...	...	...	1	...	...	...	...	**1**
Scalds	21	7	10	**3**	**1**	5	5	**3**	**1**	...	...	...	...	...	...	...	...	1	2	...	...	...	1	...	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...
INJURIES OF THE HEAD AND FACE.																																							
Contusions	6	3	3	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	1	...	...	...
Wounds—																																								
Contused...	18	14	4	...	...	...	...	...	...	...	...	...	...	4	...	...	...	1	1	...	...	1	...	...	...	3	...	...	...	3	...	...	...	2	...	...	...	3	...	...	...
Gunshot	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Incised and Punctured	2	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Lacerated	18	11	6	**1**	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	1	2	...	...	3	1	...	...	2	1	...	...	2	1	**1**	...
Concussion of Brain ...	54	48	6	...	...	7	...	...	...	10	1	...	...	9	2	...	...	7	...	...	...	7	3	...	...	4	...	...	...	2	...	...	...	1	...	...	...	1	...	...	...
Laceration of Brain ...	1	...	...	**1**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**1**	...	...	...	...	...	...	...	...	...	...	...	...	...

INJURY.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	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—																																							
Burns	5	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Contusions	4	4	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Foreign Body in Cornea	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rupture of Globe ...	5	4	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...
Wounds	17	13	4	...	...	...	3	...	...	2	...	...	...	2	1	...	...	2	...	...	...	2	...	...	...	4	...	...	...	1	...	...	...	...	...	...	...	...	...
Fractures—																																							
(Simple)—																																							
Skull (*Base*)	22	11	1	**10**	...	...	...	**1**	...	...	...	**1**	...	...	...	...	...	1	...	**3**	...	1	...	...	...	2	...	**2**	...	3	1	**3**	...	3	...	...	...	1	...	...	...
„ (*Vault*)	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Lower Jaw	**2**	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Zygoma	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
(Compound)—																																							
Skull (*without Depression*)	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Skull (*with Depression*)	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Lower Jaw	1	...	...	**1**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**1**	...	...	...	...	...	...	...	...	...	...	...	...
Nasal	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Old)—																																							
Skull	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...

INJURY.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	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.*)																																							
Traumatic separation of Sutures of Skull ...	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Old Injury to Head ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
INJURIES OF THE ABDOMEN.																																							
Contusions	15	10	4	1	...	1	1	...	...	1	...	...	...	...	...	...	...	3	...	1	...	4	2	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Wounds—																																							
Punctured	2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Gall-Bladder Ruptured ...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Intestine Ruptured... ...	3	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kidney Contused or Ruptured	5	5	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Liver Ruptured	2	...	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
INJURIES OF THE THORAX.																																							
Contusions	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wounds—																																							
Gunshot	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Punctured	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Rupture of Aorta	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...

INJURY.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
INJURIES OF THE THORAX (*continued.*)																																							
Fractures—																																							
Ribs—																																							
(*with injury to Lung*)	11	6	1	**3**	**1**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	**1**	...	...	...	**1**	...	4	...	...	...	...	1	**1**	**1**
(*without injury to Lung*)	13	10	3	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	3	2	...	...	...	...	...	...	4	1	...	...
Sternum	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
INJURIES OF THE NECK.																																							
Contusions	2	2	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Wounds—																																										
Contused	1	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gunshot	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Incised	3	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...
INJURIES OF THE BACK.																																							
Contusions	10	8	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	1	...	...	...	5	...	...	...	...	...	...	...	1	...	...	...
Wounds—																																										
Gunshot	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Lacerated	2	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Punctured	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Concussion of Spine ...	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Fracture—Dislocation of Spine—																																										
Cervical	2	...	...	**2**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**2**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lumbar	1	...	...	**1**	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	**1**	...
Intra-spinal Hæmorrhage	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

INJURY.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
INJURIES OF THE PELVIS AND GENITALS.																																							
Contusions	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Wounds—																																								
Perineum	3	2	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Scrotum	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Vulva	5	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	1	...	...	...	1	...	...	...	...
Fractures—																																								
Pelvis	4	3	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	1	...	...	...	...	...	...	...
Bladder Ruptured	1	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rupture of Urethra ...	4	4	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...
INJURIES OF THE UPPER EXTREMITY.																																							
Foreign body in	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Wounds—																																								
Incised	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Gunshot	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lacerated	12	10	2	...	...	...	...	...	...	...	...	...	...	3	...	...	...	2	...	...	...	2	1	...	...	1	...	...	...	1	...	...	...	1	1	...	...	...	...
Punctured	3	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Injuries of Nerves—																																								
Brachial Plexus ...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Median	7	3	4	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	1	...	...	2	...	...	...	...	...	...	...	...	...	...
Ulnar	6	2	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...

INJURY.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
INJURIES OF THE UPPER EXTREMITY (*continued.*)																																							
Brachial Artery Ruptured...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tendons Divided	8	7	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	2	...	...	...	1	...	...	...	2	...	...	...	...	...	...
Muscle Ruptured	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Finger Avulsed	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hæmatoma of Fore-arm ...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Fractures—																																								
(Simple)—																																								
Clavicle	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Humerus	9	9	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	3	...	...	...	...	...	...	...	3	...	...	...	...	...	...
Radius	5	4	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	1	...	...	...	...
Ulna	4	4	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	1	...	...
(Compound)—																																								
Humerus	4	3	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...
Ulna	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Phalanx...	4	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
(Old)—																																								
Radius and Ulna ...	2	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Radius	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Ulna	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dislocations—																																								
(Simple)—																																								
Humerus	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Radius	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...

INJURY.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
INJURIES OF THE UPPER EXTREMITY (*continued.*)																																							
Dislocations—																																							
(Compound)—																																							
Radius and Ulna ...	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Thumb	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
(Old)—																																								
Humerus...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Radius and Ulna ...	3	2	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...
INJURIES OF THE LOWER EXTREMITY.																																							
Contusions	12	6	5	...	1	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	2	1	...	...	2	...	...	...	2	...	...	...	...	...	...	...	1	...	1
Wounds—																																								
Bullet	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Contused	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lacerated	12	11	1	...	...	...	...	...	...	...	...	...	...	3	1	...	...	3	...	...	...	1	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...
Punctured	5	3	...	1	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Fractures—																																								
(Simple)—																																								
Astragalus	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

INJURY.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	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*)—																																							
(Simple *continued*)—																																							
Femur																																							
Neck (Extracapsular)	2	1	1	...	...																															1	1	...	...
„ *(Intracapsular)*	9	4	5	...	...																							2	...	...	...					2	5	...	...
Shaft	42	33	9	...	...	7	6	...	...	11	2	...	...	1	...	...	...	3	...	...	...	2	...	...	...	1	1	...	...	4	...	...	...	3	...	...	...	1	...	...	...
T-shaped into Knee ...	1	1	...	...	...																							1	...	...	...								
Fibula	11	6	5	...	...																	1	...	...	...	2	...	...	...	3	...	...	...		2	...	...	1	2	...	...
Metatarsal	2	2	...	...	...																	2	...	...	...														
Os Calcis	2	2	...	...	...																									1	...	...	...	1	...	...	...				
Patella	26	24	2	...	...									1	...	...	...	1	...	...	...	2	...	...	...	10	1	...	...	8	1	...	...	2	...	...	...				
Tibia	21	17	4	...	...					2	...	...	...		1	...	...	4	...	...	...	1	...	...	...	6	...	...	...	1	...	...	...	2	2	...	...	1	1	...	...
Tibia and Fibula ...	61	43	17	1	...	1	...	...	...	...	...	...	...	1	...	...	...	4	...	...	...	11	1	...	...	10	4	1	...	5	4	...	...	10	5	...	...	1	3	...	...
Pott's	13	12	1	...	...																	2	...	...	...	4	...	...	...	4	...	...	...	...	1	...	...	2	...	...	...
(Compound)—																																								
Femur	6	...	3	2	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	2	1	...	...	...	...	...	...	...	...	...	1
Patella	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia	3	3	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Tibia and Fibula ...	14	11	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	5	1	...	...	3	...	...	...	...	2	...	...	1	...	...	...
Foot	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...

TABLE I. (*continued*).

INJURY.	Total.	Discharged.		Died.		Under 5.				— 10.				— 15.				— 20.				— 30.				— 40.				— 50.				— 60.				Over 60.			
						Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		Discharged.		Died.		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.	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*)—																																							
(Old)—																																							
Femur																																							
Neck (Extracapsular)	1	1	...	...	...																											1							
Shaft	2	2	...	...	...					1								1																					
T-shaped into Knee ...	1	1	...	...	...													1																					
Patella	3	2	1	...	...																									2	1								
Tibia	1	1	...	...	...																					1													
Tibia and Fibula ...	5	3	2	...	...																					3							2						
Pott's	2	2	...	...	...																					2													
(Dislocations)—																																							
(Simple)—																																							
Astragalus	1	...	1	...	...																						1												
Hip	2	1	1	...	...																									1	1								
Semilunar Cartilage of Knee	6	4	2	...	...					1								1				3								1									
(Compound)—																																							
Astragalus	1	...	1	...	...																	1																	
DISEASES AND INJURIES Unclassified, Admissions for Instruments, &c. ...	55	39	16	...	...																																		

ABSTRACT OF TABLE I.,

With Average Duration of Surgical Patients in the Hospital.

Discharged, Cured or Relieved	M. 2,432 F. 1,538	3,970
Died	M. 130 F. 47	177
*Remaining in, December 31st, 1894 :—		
Women and Children	124	306
Men	182	
Average stay of Men	27·6 days	
„ Women...	28·3 „	

* These cases are not included in Table I. or II.

APPENDIX TO TABLE I.

ERYSIPELAS. (See separate table.)

GANGRENE.

A feeble infant of eleven months was admitted with otitis media, developed gangrene of the whole external ear, and died in three weeks.

A woman, aged 69, died of senile gangrene of the foot. There was no post-mortem.

A woman, aged 51, admitted for diabetic gangrene of the foot, died three weeks after an amputation through the knee.

HÆMOPHILIA.

A man of 24 was admitted with a chronic abscess of the thigh, which was opened. From the wound blood continued to ooze for eleven days in spite of all that could be done to arrest the hæmorrhage. Amputation of the thigh was proposed, but refused, and pressure eventually stopped the hæmorrhage, and the patient recovered completely. It was discovered some days after his admission that the patient was a "bleeder," and had had severe hæmorrhage on previous occasions after extraction of teeth.

LARDACEOUS DISEASE.

A boy, aged 15, was admitted with a localised empyema and extensive lardaceous disease. Several ribs had been resected on two previous occasions, but without permanent benefit. He died two years after the beginning of his illness. The post-mortem showed that the left pleural cavity had been almost completely obliterated, and the left lung was extremely small, although still containing air. The sinus had not quite healed.

SEPTICÆMIA AND PYÆMIA. (See separate table.)

PARASITES.

Two women, aged 18 and 24, were admitted for hydatids of the deltoid muscle and of the peritoneum respectively.

VENEREAL DISEASES.

A female infant, aged 2 months, died of congenital syphilis and marasmus.

TUMOURS.

A coachman, aged 50, with an extensive epithelioma of the larynx died of bronchitis, five days after admission.

A man, aged 58, died of a primary malignant cyst of the neck, originating in a bronchial cleft. The case has been fully described in the Transactions of the Pathological Society (November, 1894).

A blacksmith, aged 62, and a labourer, aged 56, died of epithelioma of the œsophagus. Gastrostomy was performed on the latter. Seven other men with the same disease, aged respectively 55, 55, 55, 55, 62, 65 and 74, recovered sufficiently to be able to leave the hospital. Upon one of them gastrostomy was performed.

There were twenty-seven cases of epithelioma of the tongue. All but one were men. Upon eight of them no operation was performed.

A man, aged 41, was admitted with a swelling in the right iliac fossa, which broke and discharged pus. A fungating mass then protruded, and was found to be colloid carcinoma of the cæcum. Patient died of exhaustion three months later.

A man, aged 80, was admitted with carcinoma of the rectum, and died on the following day.

Of twenty men and thirteen women admitted for carcinoma of the rectum, thirteen men and seven women underwent no operation.

Eight patients were admitted with carcinoma of the stomach. Of these, three women were transferred to the medical wards. One woman, aged 37, with carcinoma of the pylorus, died after a gastro duodenostomy. Two men, aged 47 and 62, admitted with carcinoma of the pylorus, gradually sank, and died six weeks and five weeks after admission, no operation having been performed. A man, aged 61, with carcinoma of the stomach and numerous secondary nodules in the skin, was discharged three days after admission. In another case, that of a commercial traveller, aged 60, an exploratory laparotomy showed the disease to be very extensive. The patient left the hospital a few weeks later.

A girl, aged 17, died of sarcoma of the lungs, secondary to a sarcoma of the leg, for which amputation had been performed eleven months previously.

A woman, aged 33, was admitted with symptoms of cerebral tumour and an obscure history of an injury to the head; she died rather suddenly a few days later, and at the post-mortem a glioma of the temporo-sphenoidal lobe was found.

A man, aged 40, was admitted for lympho-sarcoma of the glands of the neck, and died of it six weeks later. No operation was possible.

An infant of 15 months was admitted with a large sarcoma of the neck, and died three months later; at the time of death the tumour was almost as large as the rest of the head.

Of seven patients admitted for sarcoma of the testis, four, aged 17, 34, 35, and 44, were successfully submitted to operation; two, aged 4 and 43, were discharged without operation, on account of the existence of secondary growths. A coachman, aged 24, was admitted with a cystic sarcoma of the testis of four months' duration; he rapidly developed uræmic symptoms and died of suppression of urine on the nineteenth day. At the post-mortem, secondary growths were discovered in the heart, liver, lungs and lymphatic glands. No operation had been performed.

A woman, aged 64, was admitted with large abdominal tumours which had existed 3½ years. She died of peritonitis a few days afterwards, no operation having been performed. At the post-mortem there was found malignant disease of the uterus and dermoid cysts of both ovaries, besides recent purulent peritonitis.

Of eleven cases of dermoid cysts (other than those of the ovary), in eight the tumour was in the neck, in four in connection with the orbit, and in one in the chest wall.

There were eight patients with cystic hygromata, the tumour being in the neck (three cases), chest wall (two cases), scrotum (one case), and over the sacrum in two cases.

A man, aged 68, with lymphadenoma of the neck, was treated with the toxines of erysipelas, with slight temporary benefit. He left the hospital after seven weeks, but was re-admitted three weeks later, and died six days afterwards.

There were three cases of villous papilloma of the bladder in men aged 60, 58 and 56. The first refused operation, and died three weeks after admission. The second was a man who had had hæmaturia and other symptoms for eight years. The bladder was opened above the pubes, and the growth removed, but the patient died on the fiftieth day after the operation. The third case was that of a man upon whom no operation was performed, and whose hæmaturia subsided after a fortnight's rest in bed.

MALFORMATIONS AND DEFORMITIES.

A male infant, aged 14 days, was admitted with a large cyst of the rectum, and died collapsed on the following day. At the post-mortem the cæcum was found to have perforated from obstruction and distension, caused by the pressure of the cyst upon the rectum. The cyst was as large as a hen's egg.

DISEASES OF THE NERVOUS SYSTEM.

A man, aged 30, was admitted with meningitis of two weeks' duration. He gradually became worse, and died suddenly on the fifth day with symptoms of intra-cranial hæmorrhage. At the post-mortem, besides diffuse suppurative basal meningitis, due to otitis media, there was found an aneurism of the anterior communicating artery which had recently ruptured, and was the immediate cause of death.

A boy, aged 9, died of tubercular disease of the spinal meninges. Until five weeks before admission he had been in good health. He then lost his appetite, and began to complain of pain in the abdomen. Then he lost the use of his legs, and was admitted to the hospital. Paraplegia gradually extended upwards, until the boy died on the forty-seventh day after admission. At the post-mortem the whole of the spinal pia mater as high as the fourth cervical nerve was in a state of tubercular pulpy degeneration. In some places it was as much as one-eighth of an inch in thickness. There were numerous miliary tubercles disseminated throughout it.

DISEASES OF THE EYE.

A woman, aged 75, admitted for cataract, died of hemiplegia.

DISEASES OF THE EAR.

Four male and one female patient died of intra-cranial complications of otitis media.

DISEASES OF THE NOSE AND ANTRUM.

A boy, aged 11, was admitted with empyema of the antrum and cellulitis of the orbit. He died ten days later with meningitis, thrombosis of cavernous sinuses and other manifestations of pyæmia. At the post-mortem, much of the lower jaw was found to be bare, and there was foul sloughing about the pterygoid fossa.

DISEASES OF THE LARYNX AND TRACHEA.

A man, aged 26, admitted for tubercular laryngitis, died of pulmonary phthisis.

DISEASES OF THE VASCULAR SYSTEM.

A man, aged 59, admitted with an irreducible omental hernia, died two days later of disease of the heart and aneurism of the aorta.

DISEASES OF THE DIGESTIVE SYSTEM.

A female infant, aged 1 year, was admitted with cancrum oris, and died on the following day. At the post-mortem, tubercle was found in both lungs and in the spleen.

Another female infant, aged 10 months, died of stomatitis on the day after admission. There was no post-mortem.

A man, aged 65, developed parotitis after an operation for strangulated hernia.

The number of patients (119) admitted for reducible hernia is slightly greater than that of the previous year (110). The irreducible hernias have diminished from 29 to 27. The number of cases of strangulated hernia (45) is almost precisely the same as last year (46).

A man, aged 60, with a reducible femoral hernia and a femoral hernia of sub-peritoneal fat, died on the third day after admission, of cirrhosis of the liver, no operation having been performed.

An accountant, aged 86, admitted with an irreducible inguinal hernia, died eight days later, apparently of old age and exhaustion. There was no post-mortem.

A woman, aged 45, was admitted in a state of collapse with a strangulated femoral hernia of four days' duration. She died a few hours later, no operation having been deemed advisable.

A male infant, aged 1 month, was admitted with symptoms of intus-susception apparently of three days' duration. He was examined under chloroform, and a distinct tumour was felt in the right iliac region. Immediately afterwards the swelling disappeared and the symptoms of intus-susception subsided, the child making a good recovery.

DISEASES OF THE GENITO-URINARY ORGANS.

A carman, aged 32, admitted for tuberculosis of the genito-urinary tract, died six weeks later of uræmia.

Three men, aged 58, 63 and 74, admitted for enlarged prostate, died a few days later of uræmia and other complications, no operation having been performed. A fourth man, aged 63, died of extravasation after a supra-pubic puncture.

Of seventy-six patients admitted for stricture of the urethra, eight died. Of these, one underwent supra-pubic puncture, and three internal urethrotomy No operation was performed upon the other four. One was a butcher, aged 46, who died on the twenty-third day of phthisis and prostatic abscess. Another, aged 49, died on the sixteenth day of chronic interstitial nephritis and prostatic abscess. Two others, aged 55 and 60, died of uræmia.

A clerk, aged 35, admitted with extravasation of urine, died six weeks later. At the post-mortem much disease of the kidneys was found.

DISEASES OF THE ORGANS OF LOCOMOTION.

Fifty-nine patients were admitted for caries of the spine. Of these, three died. A woman, aged 50, admitted with a large pelvic abscess, due to caries in the lumbar region, gradually sank and died of exhaustion three months later. A female infant, aged 22 months, with caries of the dorso-lumbar region, died on the thirteenth day of suppurative pericarditis. A man, aged 30, with caries in the lumbar region and extensive suppuration, died of exhaustion ten months after admission. A boy, aged 4, with acute necrosis of the femur and tibia, died of septicæmia two days after admission. A woman, aged 35, with acute necrosis of the head of the femur, died with pulmonary phthisis three months later. A woman, aged 22, admitted with acute necrosis of the femur and pyæmia, died on the eighth day with pleurisy, pericarditis and suppuration in the knee and shoulder.

An ostler, aged 20, admitted with necrosis of the lower jaw and pyæmia, died in three days with suppurative thrombosis of the cavernous sinuses, abscesses in the lungs and hydronephrosis.

A boy, aged 15, with tuberculous disease of both upper and lower jaws and lardaceous disease, died with symptoms of meningitis. There was no post-mortem.

A male infant, aged 5 months, admitted with tuberculous disease of the hip joint, died of hydronephrosis due to congenital phimosis.

A man, aged 41, died of profuse suppuration due to hip disease.

An emaciated male infant, aged 9 months, who had recently suffered from suppurative arthritis of the knee, died of diarrhœa on the day after admission.

A platelayer, aged 37, with suppurative arthritis of the knee, was cured by a simple aspiration.

ABSCESS.

A male infant, aged 16 months, admitted with an abscess of the scrotum, died three days later of tubercular meningitis. At the post-mortem, tubercle was also found in the lungs.

BURNS AND SCALDS.

Thirty-one patients were admitted for burns; of these seven died. A boy, aged 15, with burns about the face, trunk and arms, caused by the explosion of a paraffin lamp, died shortly after admission. A boy, aged 2, fell into the fire and died collapsed fourteen hours after admission. A woman, aged 68, fell into the fire in a fit, and was badly burnt about the face and neck; she died of suppuration and exhaustion on the thirty-seventh day. A servant girl, aged 17, badly burnt about the trunk, arms and thighs, did fairly well until the eighth day, when she suddenly became collapsed and died. There was no post-mortem. A woman, aged 35, died collapsed a few hours after admission for a burn of the trunk. Two female patients, aged 1 and 4, whose clothes caught fire, died within a few hours of admission; in the case of the latter patient, œdema glottidis was the immediate cause of death, six hours after admission.

Of twenty-one patients admitted for scalds, four died. A boy, aged 2, scalded himself by falling into a bath; he died of collapse on the day after admission. A boy, aged 3, upset a kettle of boiling water, and died on the second day. A male infant, under 2 years of age, was admitted with a scald of the hand; he gradually sank and died on the eighteenth day. At the post-mortem, thrombosis of the superior longitudinal sinus was found, but no meningitis. A female infant, under 2 years of age, died of diarrhœa and bronchitis on the nineteenth day.

INJURIES OF THE HEAD.

A tool-maker, aged 74, committed suicide by filling an iron tube with gunpowder and exploding it into his mouth. Both cheeks were torn widely open, and the hard palate was broken. The man died a few minutes after admission.

A carman, aged 36, was admitted with concussion, having fallen eight feet on to his head. He recovered consciousness for a time, but subsequently became unconscious again. Unilateral convulsions occurred. He was trephined over the arm centre, and much effused blood was found. Death occurred next day, and at the post-mortem an extensive laceration of the brain was found, but no fracture of the skull.

Of twenty-two patients admitted for fracture of the base of the skull, ten died. A boy, aged 2, died of meningitis on the fourth day after admission; there was profuse discharge of cerebro-spinal fluid from the ear. A boy, aged 6, fell from a third floor window, and died two hours after admission. A man, aged 17, who had been crushed by a lift, died six hours after admission. At the post-mortem, a fracture of the anterior fossa of the skull was found, the ethmoid having been driven up into the frontal lobes; there were also extensive fractures of the nasal and superior maxillary bones and of the femur. A man, aged 17, fell down a lift shaft, and died half an hour after admission. A man, aged 19, fell fifty feet, and died shortly after admission; there were also fractures of the jaw and leg. A man, aged 31, died on the seventh day with extensive intra-cranial hæmorrhage. A man, aged 37, who had fallen from a second floor window, died within twenty-four hours; in this case there was also fracture of the cervical spine. A van driver, aged 40, was admitted on the fourth day after having fallen from his van. He was suffering from meningitis, and died on the following day. At the post-mortem, a fracture running through the ethmoid and orbital plates of the frontal was found. A clerk, aged 41, fell from an omnibus, and died fourteen hours after admission. A labourer, aged 46, who had fallen upon his head, died shortly after admission.

A coachman, aged 31, admitted with a compound fracture of the lower jaw and injuries to the chest, died of abscess of the lung on the eleventh day.

A male infant, aged 6 weeks, was dropped on to its head. When seen twenty minutes later, extensive separation of the sutures of the right side of the skull was the only sign of head injury. No bad symptoms followed.

A man, aged 18, was crushed between buffers. He died collapsed in five hours, probably of rupture of the liver, but there was no post-mortem.

A man, aged 64, was admitted with several self-inflicted punctured wounds of the mesentery. These were sewn up, but the man died two days later of shock and hæmorrhage.

A boy, aged 10, died of supposed rupture of the gall-bladder. He was admitted with distension of the abdomen and a history of a severe kick in that region one month previously. Nine pints of brown fluid containing bile and blood were removed by tapping. Two days later the abdomen was opened in the region of the gall-bladder. More fluid was let out, and numerous adhesions about the gall-bladder were found. The gall-bladder itself was not seen. Bile was oozing from one spot, which was plugged with gauze. Bile continued to ooze, diarrhœa set in, and the boy died eight days later. There was no post-mortem.

Three boys died of rupture of the duodenum. A boy, aged 15, was run over by a fire escape across the abdomen ; he was at once brought to the hospital in a state of collapse. He vomited several times. On the following day, he seemed to have almost completely recovered, and complained only of a little abdominal pain and tenderness. Later, vomiting again set in, and the boy died on the fourth day. Post-mortem : a sub-peritoneal rupture of the duodenum was found, a clot of blood as large as a hen's egg lying between the peritoneal and muscular coats, and completely blocking the duodenum. A boy, aged 17, was run over by an omnibus, and died in eighteen hours. A complete rupture of the second part of the duodenum was found, post-mortem. The rupture appeared to have been at first behind the peritoneum, which had subsequently given way and allowed fatal extravasation of fæces to take place into the peritoneal cavity. A boy, age 15, was run over across the abdomen by both wheels of a heavy waggon. On admission, soon afterwards, he was not collapsed, and complained only of slight abdominal pain. He vomited many times. Abdominal pain and sickness increasing, and distension of the abdomen supervening, an exploratory abdominal section was performed six and a half hours after the accident. A quantity of blood was found in the peritoneal cavity, but no rupture could be discovered. The patient died nine hours later, and at the post-mortem an extensive, mainly sub-peritoneal laceration, of the second part of the duodenum was found.

Two boys died of rupture of the liver. One, aged 14, had been crushed by a train ; he died in five hours. At the post-mortem the spleen was also found to have been crushed. The other, aged 15, who had been crushed between a cart-wheel and a post, survived six hours. At the post-mortem extensive laceration of the vena cava was also found.

INJURIES OF THE CHEST.

A solicitor, aged 35, who had been shot through the lung, developed pneumothorax, but recovered.

A woman, aged 29, who had been stabbed in the lung with a dinner knife, recovered.

A butcher, aged 37, was admitted with a homicidal wound of the heart, produced by a butcher's knife. He survived just fifteen minutes. At the post-mortem, the knife was found to have passed through the wall of the right ventricle, making a small opening into its cavity, then into the left pleura. The pericardial and left pleural cavities were nearly full of blood.

A man, aged 70, died of rupture of the aorta, pulmonary artery and diaphragm, and other injuries. He had fallen off a roof. He lived a quarter of an hour.

Three men, aged 74, 45 and 31, and one woman, aged 78, died of fracture of the ribs, complicated with injury to the lung. The woman had also fractured her pelvis and lacerated her heart, liver and spleen. She lived about twenty-four hours ; she had fallen from a third floor window.

INJURIES OF THE NECK.

A warehouseman, aged 17, was admitted for a gunshot wound of the neck, opposite the posterior border of the sterno-mastoid, two inches above the clavicle. The wound was found to pass directly backwards and inwards towards the spinal cord. He complained of severe pain in both arms and numbness in the legs. There was paralysis of some of the muscles of the left limbs and anæsthesia on the right side. These symptoms disappeared almost completely, and were eventually re-placed by those of descending sclerosis.

Three patients were admitted for cut throat. All recovered.

INJURIES OF THE BACK.

A painter, aged 63, who had fallen from a third floor window, died in a few hours of fracture of the lumbar spine, ribs, pelvis and several other bones.

A man, aged 25, fell fifteen feet from a ladder, and died next day of fracture of the cervical spine and skull.

A bricklayer, aged 21, with fracture of the sixth cervical vertebra and complete crush of the cord, died on the day after admission.

INJURIES OF THE PELVIS.

A labourer, aged 42, died a few hours after admission, of fracture of the pelvis, base of the skull, and other injuries.

A boy, aged 6, who had been run over, died shortly after admission, of fracture of the pelvis and rupture of the bladder.

INJURIES OF THE LOWER EXTREMITY.

A woman, aged 78, who had been run over, was admitted with a contusion of the hip. She died in two days, and at the post-mortem she was found to have heart disease and emphysema of the lungs.

A woman, aged 53, who had received a punctured wound of the knee joint ten days previously, was admitted with acute suppuration in the joint, and died of septicæmia on the twelfth day afterwards.

A man, aged 19, was admitted with suppurative arthritis of the knee, eight days after receiving a punctured wound of the joint from the mud guard of a bicycle. The joint was laid freely open and irrigated, but the suppuration extended up the thigh. The patient died of secondary hæmorrhage, caused by ulceration into the femoral artery, on the twenty-sixth day after admission.

A man, aged 34, was admitted with a simple fracture of the tibia and fibula. He developed delirium tremens, and died on the third day.

A man, aged 40, died a few hours after admission for a compound fracture of one femur, and a simple fracture of the other.

A man, aged 34, with a compound fracture of the femur, died a few hours after amputation of the limb.

A woman, aged 64, died a few hours after admission for a compound fracture of the femur and other injuries.

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.																								
Abscision	1	7	1	7	...	...	...	1	...	1	1	1	...	3	...	...	...	...	...	...	...	...	...	1
Canaliculus Slit	6	4	6	4	...	...	...	...	1	...	2	2	1	...	...	1	1	...	...	1	...	...	1	...
Cataract—																								
Extraction...	23	35	23	34	...	1	1	...	...	...	2	2	...	...	...	1	1	2	4	6	12	16	3	8
Needling	2	2	2	2	...	...	...	...	...	...	2	...	...	...	...	...	...	1	...	1	...	...	...	...
Evisceration	2	1	2	1	...	...	...	1	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...
Extirpation of Globe... ...	9	7	9	7	...	...	...	...	...	...	1	...	1	...	3	...	1	2	...	3	2	2	1	...
Foreign Body removed ...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Iridectomy	6	16	6	16	...	...	...	1	1	...	1	4	...	...	...	3	...	3	...	2	3	3	1	...
Needling Opaque Capsule ...	8	8	8	7	...	1	...	...	...	...	2	...	...	...	...	...	...	1	2	1	4	3	...	3
Paracentesis of Anterior Chamber	1	2	1	2	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	1
Plastic Operation on Eyelid ...	3	2	3	2	...	...	...	...	...	...	1	...	1	...	1	2	...	...	...	...	...	...	...	...
Removal of Pterygium ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Removal or erasion of Rodent Ulcer	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...
Tattooing Cornea	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
For Squint—																								
Tenotomy	7	14	7	14	...	...	...	...	2	6	4	8	1	..	...	...	...	...	...	...	...	...	...	...
Advancement of Rectus ...	2	...	2	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...

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.
PLASTIC OPERATIONS.																								
For Cleft Palate	14	10	14	10	...	..	3	...	10	4	1	5	...	1	...	...	...	...	...	...	...	...	...	...
„ Contracted Scars... ...	...	4	...	4	...	...	...	1	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...
„ Deformity of Eyelid ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
„ Fœcal Fistula	1	3	1	3	...	...	...	...	...	...	...	...	...	2	...	1	...	...	1	...	...	...	...	...
„ Gunshot Wound of Face...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	..	...	...	...	...	...	...
„ Hare-Lip	16	6	16	6	...	...	15	6	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
„ Hypospadias	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
„ Imperforate Anus ...	1	1	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ Ruptured Perineum ...	...	3	...	3	...	...	...	...	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...	...
„ Vesico-Vaginal Fistula ...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
„ Rhinoplasty	1	2	1	2	...	...	...	...	...	...	...	...	1	...	...	1	...	1	...	..	...	...	...	...
EXCISIONS OF BONES AND JOINTS.																								
Astragalus	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Clavicle, part of (for Tubercular Ostitis)	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Elbow	1	1	1	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...
Head of Metatarsal (for Hallux Valgus)	1	2	1	2	...	...	...	...	...	...	...	1	...	...	1	1	...	...	...	...	...	...	...	...
Head of Phalanx(for Hammer Toe)	3	...	3	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...
Hip	5	4	4	4	1	...	...	...	4	2	...	2	1	...	...	...	...	...	...	...	...	...	...	...
Knee	8	4	8	4	...	...	...	...	1	2	4	...	1	1	1	1	1	...	...	...	...	...	...	...
Os Calcis	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...

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.
EXCISIONS OF BONES AND JOINTS (*continued.*)																								
Radius, part of (for Ankylosis)	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rib	16	7	12	7	4	...	2	2	1	1	2	2	7	1	3	1	...	...	1	...	...	...	...	...
Superior Maxilla	4	1	4	1	...	...	...	...	...	...	...	...	1	...	...	...	1	...	2	1	...	...	...	...
Inferior Maxilla	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
OPERATIONS ON BONES.																								
Osteoclasia—																								
Radius and Ulna	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Femur—																								
For Contracted Knee ...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Curvature of Shaft ...	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Genu Valgum	5	4	5	4	...	...	3	2	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...
For Genu Varum	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Tibia and Fibula	6	5	6	5	...	...	3	3	2	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Tarsus—																								
For Talipes	1	1	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Osteotomy—																								
Femur—																								
Infratrochanteric	3	5	3	5	...	...	...	...	1	2	1	2	1	1	...	...	...	...	...	...	...	...	...	...
Of Shaft	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Supra Condyloid	2	2	2	2	...	...	...	...	...	...	2	1	...	1	...	...	...	...	...	...	...	...	...	...
Tibia and Fibula	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Tarsus	2	...	2	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

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 BONES (*continued*.)																								
Osteotomy (*continued*)—																								
Erasion or Gouging of Carious Bone—																								
Jaw Bones	3	...	3	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Malar	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Mastoid	2	...	2	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Sternum	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Clavicle	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	..	...	...	...	...	...	...	...	...
Femur	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Tibia...	4	1	4	1	...	...	1	1	...	...	2	...	1	...	...	...	...	...	...	...	...	...	...	...
Fibula	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Os Calcis	3	...	3	...	...	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...
Metatarsus	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Sequestrotomy—																								
Jaw Bones	1	2	1	2	...	...	...	...	...	...	...	1	...	...	...	...	1	1	...	...	...	...	...	...
Rib	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Humerus	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Radius	2	1	2	1	...	...	1	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...
Ulna	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Phalanx	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Pubes...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Femur	5	1	5	1	...	...	...	...	...	...	5	...	...	...	...	..	...	1	...	...	...	...	...	...
Tibia...	5	1	5	1	...	...	...	...	...	...	2	1	2	...	...	...	1	...	...	...	...	...	...	...
Trephining—																								
Femur (for Ostitis) ...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...

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 BONES (*continued*.)																								
Trephining (*continued*)—																								
Mastoid—																								
(For Suppurative Otitis) ...	12	3	8	2	4	1	1	1	3	1	2	1	3	...	2	...	...	...	1	...	...	...	...	...
Skull—																								
(For Cerebral Abscess) ...	1	1	...	...	1	1	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...
(For Recent Injury) ...	3	...	1	...	2	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...
(For Old Injury)	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
(For Traumatic Epilepsy)...	2	...	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Craniectomy	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Elevation of Depressed Fracture	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Laminectomy for Paraplegia	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Linear Osteotomy for Ostitis	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Wiring Fractured Patella ...	4	...	4	...	...	...	...	...	...	...	...	...	1	...	2	...	1	...	...	...	...	...	...	...
OPERATIONS ON JOINTS.																								
Removal of Loose Bodies—																								
Knee	3	...	3	...	...	...	...	...	...	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...
Removal of Semilunar Cartilage	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Erasion of Tubercular Joints																								
Elbow	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Wrist	2	1	2	1	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	1	...	...	...	...
Knee	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Ankle	1	1	1	1	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...

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 JOINTS (*continued.*)																								
Metatarso-phalangeal Joint ...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Erasion of Tubercular Disease of Tendon Sheath at Wrist..	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Knee drained or aspirated ...	4	...	4	...	...	...	...	...	1	...	...	...	...	...	2	...	1	...	...	...	...	...	...	...
AMPUTATIONS.																								
Primary—																								
Arm—																								
(*Upper Third*)—																								
For Compound Fracture of Humerus	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Thumb	2	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...
Fingers	6	...	6	...	...	...	...	...	...	...	2	...	2	...	1	...	...	...	1	...	...	...	...	...
Thigh—																								
(*Lower Third*)—																								
For Compound Fracture of Tibia and Fracture of Femur into Knee ...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Toe	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Secondary—																								
Thigh—																								
(*Upper Third*)—																								
For Gangrene after crush	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Finger	2	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...

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.
AMPUTATIONS (*continued.*)																								
For Disease—																								
Arm—																								
(*Upper Third*)—																								
For Conical Stump ...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
(*Lower Third*)—																								
For Tubercular Elbow ...	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...
Forearm—																								
(*Lower Third*)—																								
For Epithelioma of Hand	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
For Tubercular Wrist ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Thumb	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Fingers	8	7	8	7	...	...	...	...	1	...	1	1	1	2	1	1	3	1	1	1	...	1	...	...
Hip—																								
For Sarcoma of Femur	1	1	...	1	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...
Thigh—																								
Upper Third)—																								
For Cellulitis	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Middle Third)—																								
For Infantile Paralysis	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
For Necrosis of Femur...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
For Suppurating Knee ...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
For Tubercular Knee ...	2	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...

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.
AMPUTATIONS (*continued.*)																								
For Disease (*continued*)—																								
Thigh (*continued*)—																								
(*Lower Third*)—																								
For Infantile Paralysis ...	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
„ *Spurious Elephantiasis*	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
„ *Sarcoma of Tibia* ...	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
„ *Senile Gangrene* ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ *Tubercular Knee* ...	8	1	8	1	...	...	...	...	1	...	3	...	...	...	3	...	1	...	...	...	1	...	...	...
Through the Knee—																								
For Diabetic Gangrene ...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
Leg—																								
(*Upper Third*)—																								
For Epithelioma	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
„ *Ulcerated Stump* ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
„ *Old Fracture* ...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
(*Lower Third*)—																								
For Tubercular Ankle ...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
„ *Senile Gangrene* ...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
„ *Old Pirogoff's Amputation*	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Foot—																								
(*Syme's*)—																								
For Tubercular Ankle ...	4	1	4	1	...	...	...	...	...	...	2	...	1	1	...	...	1	...	...	...	...	...	...	...
„ *Old Chopart's Amputation*	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...

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.
AMPUTATIONS (*continued.*)																								
For Disease (*continued*)—																								
Toes	3	4	3	4	...	...	...	...	...	...	1	...	2	1	...	2	...	...	...	...	...	1	...	...
Penis—																								
For Epithelioma... ...	8	...	8	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	3	...	2	...	...	...
OPERATIONS ON BREAST.																								
Amputation for Duct Carcinoma	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...
Amputation of whole Breast for Sarcoma...	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...
Partial Amputation for Sarcoma	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...
Removal of Adeno-Fibroma...	...	13	...	13	...	...	...	...	...	...	...	5	...	5	...	2	...	1	...	...	...	...	...	...
Removal of Cysts	1	6	1	6	...	...	...	...	...	...	...	...	...	...	...	1	...	4	1	1	...	...	...	...
Amputation of whole Breast for Cystic Disease	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
Partial Amputation for Cystic Disease	...	2	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...
Amputation for Tubercular Disease	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Partial Amputation for Mastitis	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...

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 BREAST (*continued.*)																								
Amputation of whole Breast for Carcinoma—																								
With Removal of Axillary Glands	...	43	...	41	...	**2**	...	...	...	...	...	...	...	1	...	3	...	21	...	14	...	3	...	1
Without Removal of Axillary Glands	...	7	...	7	...	...	...	...	...	...	...	...	...	...	...	1	...	4	...	1	...	1	...	...
Partial Amputation for Carcinoma—																								
With Removal of Glands ...	...	9	...	8	...	**1**	...	...	...	...	...	...	...	...	...	1	...	3	...	1	...	3	...	1
Without Removal of Glands ...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Local Removal of Recurrent Carcinoma—																								
Breast	...	9	...	8	..	**1**	...	...	...	...	...	...	...	...	...	...	...	4	...	4	...	1	...	...
Glands	...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	1	...	...
Breast and Glands ...	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...
Carcinoma treated by Caustics	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Removal of Nipple for Chronic Imflammation	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
REMOVAL OF TUMOURS.																								
Cysts—																								
Dental	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...

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.
Removal of Tumours (*continued*.)																								
Cysts (*continued*)—																								
Dermoid—																								
Chest Wall	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Neck	3	3	3	3	...	...	...	...	...	1	1	...	1	...	...	...	...	2	...	...	1	...	...	...
Orbit	1	3	1	3	...	...	...	1	...	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Sebaceous	5	6	5	6	...	...	1	...	...	1	...	1	2	1	...	1	...	1	...	1	1	...	1	...
Serous	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Synovial	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Adeno-chondro Fibroma ...	1	1	1	1	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Adeno-Fibroma	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Adenoma	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Angeio-Fibroma	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Enchondroma	2	1	2	1	...	...	...	...	...	...	1	...	1	...	...	...	...	1	...	...	...	...	...	...
Exostosis	6	4	6	4	...	...	...	...	1	...	3	4	2	...	...	...	...	...	...	...	...	...	...	...
Fibroma	7	5	7	5	...	...	...	...	1	...	1	1	1	1	...	1	1	2	1	...	2	...	...	...
Hygroma	3	2	3	2	...	...	2	2	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Keratoma	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Lipoma	7	12	7	12	...	...	1	...	1	...	...	2	1	5	1	1	3	3	...	1	...	...	...	...
Lymphadenoma	3	...	3	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
Lymphangioma	...	2	...	2	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...
Neuro-Fibroma	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	..
Nævus	1	3	1	3	...	...	1	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Papilloma	5	6	5	6	...	...	...	...	...	...	...	...	...	2	2	1	...	...	1	1	1	2	1	...
Polypus...	6	9	6	9	...	...	1	...	2	1	...	2	1	1	1	3	1	...	...	2	...	...	...	...
Bronchocele	3	5	3	5	...	...	...	...	...	...	...	...	2	2	...	...	...	3	...	...	1	...	...	...

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.
REMOVAL OF TUMOURS (*continued.*)																								
Epithelioma—																								
Cheek	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...
Floor of Mouth	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Glands of Neck	8	1	8	1	...	...	...	...	...	...	...	...	...	...	1	1	2	...	4	...	1	...	...	...
Glands of Groin	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...
Hand	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Jaw (Upper)	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...
Jaw (Lower)	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...
Lip	9	...	9	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	2	...	4	...
Palate	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Scrotum	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...
Tonsil	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Vulva	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Rodent Ulcer—																								
Face	7	3	6	3	1	...	...	...	...	...	...	...	...	...	2	...	1	...	...	...	2	2	2	1
Sarcoma—																								
Abdominal Wall	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Axilla	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Back	2	...	2	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...
Jaw	2	1	2	1	...	...	...	...	...	...	...	1	1	...	...	...	...	...	1	...	...	...	...	...
Cheek	2	2	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2
Glands of Neck	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1
Groin	1	...	1	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Muscle	2	1	2	1	...	...	...	...	...	...	1	...	...	1	1	...	...	...	...	...	...	...	...	...

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.
REMOVAL OF TUMOURS (*continued*.)																								
Sarcoma (*continued*)—																								
Popliteal Nerve	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Parotid	1	2	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...
Thigh	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
Tonsil	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
OPERATIONS ON TONGUE.																								
For Epithelioma—																								
Excision of Whole Tongue with Scissors	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...
Excision of one Lateral Half with Scissors	10	1	8	1	2	...	...	...	...	...	...	...	...	...	...	1	2	...	6	...	1	...	1	...
Excision of One Half and and part of Lower Jaw ...	2	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...
Excision of One Half together with splitting of Lower Jaw	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Local Removal	4	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	1	...	...	...
OPERATIONS ON BURSÆ, FASCIÆ AND TENDONS.																								
Bursæ Removed	2	6	1	6	1	...	...	...	...	...	...	1	...	2	...	...	1	1	1	2	...	...	...	...
Ganglia Incised or Removed	2	1	2	1	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1	...	...	...	...	...
Suture of Tendons—																								
Primary	5	2	5	2	...	...	...	...	...	1	1	...	...	...	...	...	2	...	2	...	...	...	...	1
Secondary	2	1	2	1	...	...	...	...	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...

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 BURSÆ, FASCIÆ AND TENDONS (*continued.*)																								
Palmar Fascia Divided ...	2	1	2	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	1	...	...	...	...
Lateral Ligaments divided—																								
For Contracted Finger ...	...	2	...	2	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
„ *Hammer Toe*	1	1	1	1	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Tenotomy—																								
For Contracted Hamstrings ...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
„ *Hammer Toe*	2	...	2	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...
„ *Talipes*	12	3	12	3	...	...	4	...	5	1	...	2	2	...	1	...	...	...	...	...	...	...	...	...
„ *Wry Neck*	3	5	3	5	...	...	1	...	1	...	1	4	...	1	...	...	...	...	...	...	...	...	...	...
OPERATIONS ON THE NOSE.																								
For Deviated Septum ...	5	2	5	2	...	...	...	...	...	...	2	2	2	...	1	...	...	...	...	...	...	...	...	...
OPERATIONS ON THE LARYNX AND TRACHEA.																								
Tracheotomy—																								
For Diphtheria	24	16	13	5	**11**	**11**	21	10	3	5	...	...	...	...	...	1	...	...	...	...	...	...	...	...
„ *Epithelioma of Larynx*	6	...	3	...	**3**	...	...	...	...	...	...	...	...	...	1	...	2	...	3	...	...	...	...	...
„ *Foreign Body in Larynx*	2	...	1	...	**1**	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
„ *Œdema of Glottis* ...	1	1	1	...	...	**1**	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Preliminary to Removal of Naso-Pharyngeal Tumour	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...

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 NERVES.																								
Freeing Nerve from Scar—																								
Median	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ulnar	1	1	1	1	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...
Nerve Stretching—																								
Brachial Plexus	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Inferior Dental	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Infra-orbital	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Supra and Infra-orbital...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Lingual	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Median	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Excision of Lingual Nerve ...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Suture of Nerves—																								
Primary—																								
Median	...	1	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Musculo-spiral	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Ulnar	1	2	1	2	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	1
Secondary—																								
Median	1	2	1	2	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...
Ulnar	1	1	1	1	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...

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 VASCULAR SYSTEM.																								
Ligature of Arteries for Aneurysm—																								
Brachial and Ulnar ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Superficial Femoral ...	1	1	1	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...
Superficial and Deep Femoral	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Ligature of External Carotid preliminary to removal of Upper Jaw	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Ligature of External Jugular Vein for Venous Aneurysm	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Ligature or Excision of Varicose Veins	33	9	33	9	...	...	...	...	...	...	7	...	20	6	1	2	5	1	...	...	...	...	...	...
OPERATIONS ON GENITO-URINARY ORGANS.																								
Circumcision	60	...	60	...	...	...	6	...	7	...	15	...	22	...	5	...	3	...	1	...	1	...	...	...
Nephrotomy	2	5	1	5	1	...	...	...	...	...	...	...	1	...	...	2	1	3	...	...	...	...	...	...
Nephrectomy	2	1	2	1	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	1	...	...	...
Nephro-Lithotomy	3	1	3	1	...	...	...	...	...	...	1	...	...	...	1	1	1	...	...	...	...	...	...	...
Nephrorraphy	1	3	1	3	...	...	...	...	...	...	...	...	1	2	...	1	...	...	...	...	...	...	...	...
Lithotrity	3	1	3	1	...	...	...	...	...	...	...	1	...	...	1	...	...	...	1	...	1	...	...	...
Lithotomy—																								
(*Supra-pubic*)	5	...	4	...	1	...	...	...	...	...	1	...	2	...	1	...	...	...	...	...	...	...	1	...

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 GENITO-URINARY ORGANS (*continued.*)																								
Cystotomy—																								
(*Supra-pubic*)	3	...	...	...	**3**	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	...	...
(*Lateral*)	1	...	...	...	**1**	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
(*Median*)	1	...	...	...	**1**	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Tapping Bladder	4	...	2	...	**2**	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	2	...	...	...
Castration—																								
For Retained Testis ...	2	...	2	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...
„ *Sarcoma*	4	...	4	...	...	...	...	...	...	...	1	...	...	...	2	...	1	...	...	...	...	...	...	...
„ *Syphilis*	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
„ *Tubercular Disease* ...	4	...	4	...	...	...	...	...	...	...	1	...	2	...	...	...	1	...	...	...	...	...	...	...
Erasion of Tubercular Testis..	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
Transplantation of Retained Testis	3	...	3	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...
Ligature of Varicocele—																								
(*Open Method*)	15	...	15	...	...	...	...	...	...	...	10	...	4	...	1	...	...	...	...	...	...	...	...	...
(*Subcutaneous*)	20	...	20	...	...	...	...	...	...	...	10	...	10	...	...	...	...	...	...	...	...	...	...	...
Injection of Hydrocele ...	7	...	7	...	...	...	...	...	...	...	1	...	2	...	1	...	3	...	...	...	...	...	...	...
Excision of Tunica Vaginalis for Hydrocele	16	...	16	...	...	...	...	...	1	...	3	...	3	...	3	...	3	...	2	...	1	...	...	...
Excision of Encysted Hydrocele of Cord	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Excision of Hæmatocele ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Internal Urethrotomy ...	18	...	15	...	**3**	...	...	...	...	...	...	...	2	...	6	...	6	...	1	...	2	...	1	...
External Urethrotomy—																								
For Ruptured Urethra ...	3	...	3	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	...	...	...	...	...	...
„ *Stricture*	6	...	6	...	...	...	...	...	...	...	...	...	1	...	1	...	1	...	2	...	...	...	1	...

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 GENITO-URINARY ORGANS (*continued.*)																								
Removal of Urethral Caruncle	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Hysterectomy (Vaginal) ...	...	6	...	6	...	...	...	...	...	...	...	...	...	...	...	2	...	3	...	1	...	...	...	...
OPERATIONS ON THE RECTUM AND ANUS.																								
Anal Fissure or Ulcer Incised	4	7	4	7	...	...	...	...	...	...	...	1	1	1	1	3	1	2	1	...	...	...	...	...
Anal Ulcer Cauterized ...	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Anal Fistula Incised	33	8	33	8	...	...	...	...	...	...	...	1	8	2	9	3	10	2	5	...	1	...	...	...
Hæmorrhoids Excised (Whitehead's Operation)	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
Hæmorrhoids Crushed ...	2	2	2	2	...	...	...	...	...	...	...	...	...	1	...	1	1	...	1	...	...	...	...	...
Hæmorrhoids Tied	24	20	24	20	...	...	...	...	...	...	...	...	4	1	2	15	13	2	4	1	1	1	...	...
Prolapsed Rectum Cauterised	1	2	1	2	...	...	...	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...
Prolapsed Rectum Tied ...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Excision of Rectum	2	2	2	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	2	1	...
Linear Proctotomy	1	1	1	1	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...
MISCELLANEOUS OPERATIONS.																								
Avulsion of Toe-Nail	2	1	2	1	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	...	...
Cauterisation of Cancrum Oris	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Cauterisation of Noma ...	...	1	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Cauterisation of Mole... ...	...	3	...	3	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...

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.
MISCELLANEOUS OPERATIONS (*continued.*)																								
Cauterisation of Nævus ...	...	3	...	3	...	...	...	2	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
Electrolysis for Nævus ...	2	4	2	4	...	...	...	3	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...
Excision of Malignant Pustule	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Excision of Tubercular Glands	14	24	14	24	...	...	1	...	2	3	6	8	5	9	...	3	...	...	...	1	...	...	...	...
Erasion of Tubercular Glands	7	5	7	5	...	...	...	...	4	...	1	4	2	1	...	...	...	...	...	...	...	...	...	...
Cauterisation of Tubercular Glands	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Erasion or Excision of Lupus	5	16	5	16	...	...	...	1	...	...	3	5	...	6	1	2	...	1	1	...	...	1	...	...
Removal or Erasion of Tubercular Ulcer	2	1	2	1	...	...	...	...	...	...	...	...	2	...	...	1	...	...	...	...	...	...	...	...
Erasion of Carbuncle ...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	1	...
Injection of Carbuncle ...	1	1	1	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...
Removal of Enlarged Tonsils	10	9	10	9	...	...	...	1	5	3	5	4	...	...	...	1	...	...	...	...	...	...	...	...
Removal of Adenoid Vegetations	24	19	24	19	...	...	3	2	14	7	6	8	1	2	...	...	...	...	...	...	...	...	...	...
Excision or Injection of Spina Bifida	1	1	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Injection of Hygroma ...	1	1	1	1	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Drainage of Antrum	2	2	2	2	...	...	...	...	1	...	...	1	...	1	...	...	1	...	...	...	...	...	...	...
Excision of Painful Scar ...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...
Removal of Hydatid from Deltoid	...	1	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Removal of Salivary Calculus	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...

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 FOR HERNIA.																								
Herniotomy for Strangulated Hernia—																								
Femoral	1	11	...	5	1	6	...	...	...	...	...	...	...	...	...	1	...	3	...	2	1	3	...	2
Inguinal	13	...	10	...	3	...	1	...	...	...	3	...	1	...	3	...	1	...	2	...	1	...	1	...
Umbilical	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...
For Inguinal Hernia reduced *en masse*	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Radical Cure—																								
(*Reducible*)—																								
Femoral	1	6	1	6	...	...	...	...	...	...	...	...	...	1	...	2	...	3	1	...	...	...	...	...
Inguinal	77	8	76	8	1	...	4	...	5	...	31	3	18	5	7	...	6	...	5	...	1	...	...	...
Umbilical	1	1	1	1	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...
Ventral	...	5	...	5	...	...	...	1	...	...	...	...	...	3	...	...	...	1	...	...	...	...	...	...
(*Irreducible*)—																								
Femoral	2	8	2	8	...	...	...	...	...	...	1	...	1	3	...	3	...	2	...	...	...	...	...	...
Inguinal	6	2	6	2	...	...	1	1	...	...	...	...	3	...	1	1	1	...	...	...	...	...	...	...
Umbilical	1	2	1	2	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	1	...	...
Ventral	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
Hydrocele of Hernial Sac Removed	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...
COLOTOMY.																								
Inguinal—																								
For Carcinoma	6	8	5	8	1	...	...	...	...	...	...	...	2	...	2	1	1	1	1	4	...	2	...	...
„ *Chronic Obstruction (Cause Uncertain)* ...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
„ *Chronic Peritonitis* ...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...

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.																								
For Punctured Wound of Mesentery	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
For Peritonitis	1	6	1	4	...	2	...	...	1	...	...	...	...	2	...	3	...	1	...	...	...	...	...	...
For Perforative Peritonitis—																								
From Gastric Ulcer ...	1	1	...	...	1	1	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...
„ *Duodenal Ulcer* ...	2	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
„ *Other Ulcers*	1	1	1	...	...	1	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
For Hepatic Abscess	2	...	1	...	1	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
For Intra-abdominal Abscess	1	1	1	...	...	1	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...
For Intestinal Obstruction (Acute)	...	2	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...
For Intus-susception	1	1	...	...	1	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
For Appendicitis	6	1	3	...	3	1	...	...	...	...	3	1	2	...	...	...	1	...	...	...	...	...	...	...
For Extra Uterine Pregnancy	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Removal of Uterine Appendages...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Enterotomy	4	2	1	1	3	1	...	...	...	...	...	...	1	...	1	...	1	...	1	...	...	2	...	...
Enterectomy—																								
For Acute Intestinal Strangulation	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
For Fæcal Fistula	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
For Carcinoma	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Gastrostomy	2	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...
Gastro-Jejunostomy	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...
Removal of Uterine Fibroid...	...	4	...	2	...	2	...	...	...	...	...	...	...	...	...	3	...	...	...	1	...	...	...	...
Hysterectomy (Abdominal)*	...	8	...	4	...	4	...	...	...	...	...	...	...	...	...	4	...	4	...	...	...	...	...	...
Ovariotomy	...	31	...	29	...	2	...	...	...	...	...	1	...	12	...	8	...	6	...	3	...	1	...	...

* For Vaginal Hysterectomy and Abdominal Nephrectomy *see* Genito-Urinary Organs.

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.*)																								
Exploratory—																								
For Abscess...	1	1	1	...	...	1	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...
„ *Hydatids of Peritoneum*	...	1	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
„ *Malignant Disease—*																								
Of Intestine	1	1	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...
„ *Kidney*	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
„ *Stomach*	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
For Retro-peritoneal Tumour	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
For Ruptured Duodenum...	1	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
For Ruptured Gall-Bladder	1	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...

STATISTICS OF ANÆSTHETICS.

During the year 1894 Anæsthetics were administered 5,714 times.

Chloroform	2,350 times.
Nitrous Oxide Gas	1,682 ,,
Ether	981 ,,
Gas and Ether	701 ,,
Total	5,714 ,,

There were two deaths under chloroform. A man, aged 44, with phlegmonous erysipelas of the leg, died of syncope during the administration of chloroform preparatory to the opening of an abscess.

The other case was that of a man, aged 40, to whom chloroform was being administered preparatory to a tracheotomy for malignant disease of the larynx. Much dyspnœa was present before the inhalation was commenced. Breathing ceased suddenly, and the trachea was immediately opened, but in vain.

APPENDIX TO TABLE II.

OPERATIONS ON THE EYE.

A woman, aged 75, after extraction of a cataract and a subsequent needling operation for capsular opacities, died of hemiplegia on the forty-fourth day after admission.

PLASTIC OPERATIONS.

Four patients were operated upon for **fœcal fistula**; in three cases an extra-peritoneal operation was performed, but the fistula was not permanently closed. The fourth case was that of a woman, aged 35, whose fœcal fistula was the result of an enterotomy to relieve intestinal obstruction following hysterectomy; two local operations having proved unsuccessful, the abdomen was opened three months after the formation of the fistula. Eleven inches of small intestine were resected by Maunsell's method. For two days the patient was much collapsed, but she then made a good recovery, leaving the hospital completely cured six weeks later. She was quite well a year afterwards.

Rhinoplasty was successfully performed three times for gunshot wound, old syphilitic ulceration, and stenosis of the nares respectively.

EXCISION OF BONES AND JOINTS.

The elbow was excised once for old dislocation and once for tubercular disease.

Excision of the hip was performed nine times for tubercular disease; one patient, aged 20, died of secondary hæmorrhage nine months after the operation.

Excision of the knee was performed nine times for tubercular disease and three times for deformity.

Excision of a small portion of the radius was performed upon a child, aged 5, for ankylosis of the superior radio-ulnar joint.

Excision of the upper jaw was performed four times for epithelioma and once for fibro-sarcoma of the naso-pharynx.

Partial excision of the lower jaw was performed twice for epithelioma.

Excision of one or more ribs was performed successfully seventeen times for empyema, once for drainage of an hepatic abscess, and once for malformation of the twelfth rib. Four patients died after excision of ribs for bronchiectasis, hepatic abscess, intra-peritoneal abscess and empyema; in the last case many ribs were resected, and at the post-mortem tubercle was found in the lungs and in the colon.

OPERATIONS ON BONES.

Eight male and two female patients recovered after **trephining of the mastoid** for otitis media; in one of these cases the internal jugular vein was also tied.

Five patients died. A girl, aged 13, who had had for two months discharge from the ear, for six weeks pain in the head, for three weeks vomiting and drowsiness, was admitted with a mastoid abscess; the mastoid was trephined, and subsequently the skull was trephined over the temporo-sphenoidal lobe, a large abscess being opened. The patient died of meningitis a fortnight later, on the eighteenth day after admission; no post-mortem.

A soldier, aged 20, was admitted with otitis media and symptoms of pyæmia; the mastoid was trephined, the lateral sinus opened, and the internal jugular vein tied, but the man died on the fourth day after admission; no post-mortem.

A boy, aged 9, was admitted with otitis media of many years' duration; acute symptoms had lasted three weeks; the mastoid was trephined, but the patient died on the forty-second day after admission; no post-mortem.

A man, aged 37, was admitted with otitis media and cerebral symptoms. The mastoid was trephined without relief; the skull was then trephined, and an abscess opened in the temporo-sphenoidal lobe; the patient died two days later; no post-mortem.

A man, aged 39, who had suffered for many years from otitis media, was admitted with symptoms of intra-cranial suppuration. The mastoid was trephined on both sides, and the lateral sinuses opened, but without relief. The patient died a week after admission. At the post-mortem, diffuse meningitis, sub-dural abscess, and suppurative thrombosis of the internal jugular vein were found.

The **skull was trephined** three times for recent injury; a van driver, aged 40, was admitted with meningitis and fractured base four days after a fall from his van; he was trephined over the frontal lobe, but died next day. A post-mortem showed extensive fracture of the ethmoid and frontal bones.

A man, aged 36, was admitted unconscious, having fallen eight feet on to his head; he recovered consciousness for a time, but subsequently became unconscious again. Unilateral convulsions occurred. Trephining was done over the arm centre, and much effused blood found; death occurred next day. At the post-mortem much laceration of the brain was found, but no fracture.

A laundryman, admitted for a scalp wound, became comatose, and was trephined on the third day after admission; nothing was found, and the man eventually recovered and left the hospital on the eighty-fourth day after admission.

A woman, aged 32, who had received a blow upon the head sixteen months previously, was trephined for headache and other symptoms, but without much benefit.

A boy, aged 6, was trephined for Jacksonian epilepsy; little or no improvement followed the operation.

A man, aged 55, fell eight feet on to his head, walked to the hospital, and then became unconscious, then restless and delirious; after four days epileptiform convulsions ensued and he was trephined, some blood clot and a small cyst were found. He improved considerably, then had a relapse, and eventually left the hospital quite well two months after admission.

A child, aged 4, recovered after **craniectomy** for microcephalic idiocy, but the mental condition was in no way improved.

Laminectomy was performed once; the patient was a man, aged 51, who had received an injury to the back seven years previously, and who was admitted with symptoms of caries of the mid-dorsal spine. Pain had been present for four years, complete paraplegia for six months. There were no external signs of suppuration and no deformity. The laminæ of the fifth, sixth and seventh dorsal vertebræ were removed, and a chronic abscess discovered, situated chiefly between the bones and the theca; the latter was not opened. The abscess was drained, and the wound healed. The patient recovered control over his sphincters, his sensation improved considerably, and he regained some power over his legs. He left the hospital five months after the operation.

Wiring of the patella was performed four times. A man, aged 39, who had broken his patella in April, was re-admitted in August with a fresh fracture of the same bone. Wiring was done by the open method on the second day; the wound healed by first intention, and the patient left the hospital on the thirty-eighth day. A man, aged 31, had subcutaneous wiring of the patella performed on the fourteenth day after the accident. A man, aged 30, was wired on the eighth day. A man, aged 43, with a fracture of eighteen months' standing, was also wired. In the last three cases the method adopted was that of subcutaneous all-round wiring. Primary union occurred in all cases.

AMPUTATIONS FOR INJURY.

No death occurred after any amputation, primary or secondary, for injury.

AMPUTATIONS FOR DISEASE.

A man, aged 21, died of hæmorrhage and shock on the day after an amputation at the hip for a large sarcoma of the femur of two years' duration.

A woman, aged 31, recovered after a similar operation for recurrent sarcoma of the femur. Amputation through the thigh on the same side had already been performed some months before.

A man, aged 74, died of shock a few hours after amputation of the thigh for ulceration and cellulitis.

A woman, aged 51, with diabetic gangrene of the foot, underwent amputation through the knee; she did well for a few days, then gradually sank, and died on the twentieth day after the operation, and two and a half months after admission.

OPERATIONS ON THE BREAST.

A woman, aged 37, died with an abscess in the brain and local recurrence six weeks after amputation of the breast for a very large carcinomatous tumour.

A woman, aged 44, died of septicæmia on the seventh day after removal of the breast and axillary glands for an ulcerating scirrhus.

A woman, aged 56, became insane ten days after amputation of the breast for scirrhus, and was discharged in that condition; the wound had healed by first intention.

A very fat woman, aged 72, was admitted with a mass of scirrhus in the outer part of the breast and in the axilla. Part of the breast and the axillary glands were removed, a larger operation not being considered advisable on account of the age and general condition of the patient. The patient did fairly well for a few days, and then died on the thirteenth day with congestion of the lungs and partial suppression of urine. At the post-mortem, secondary growths were found in the liver; the wound had almost completely healed.

A woman, aged 51, died of secondary growths in the viscera a month after removal of a recurrent growth from the breast.

REMOVAL OF TUMOURS.

Three male and five female patients underwent operations for removal of **bronchocele**. All recovered. The tumour in six cases was a cyst, and in the other two a cystic adenoma. Intra-glandular enucleation was the operation performed in each case.

Of ten patients who underwent operation for the removal of **rodent ulcer** from the face, one died; he was a feeble old man with a large ulcer; at the post-mortem he was found to have advanced interstitial nephritis.

OPERATIONS ON THE TONGUE.

Twenty operations were performed for removal of epithelioma of the tongue, with four deaths.

A man, aged 66, who had been a heavy drinker, died of delirium tremens fourteen days after removal of half the tongue.

A man, aged 54, died of hæmophilia after removal of half the tongue for a small epithelioma; the patient was a strong and healthy-looking man; bleeding began a few hours after the operation, and continued until the fifth day, when death occurred. It transpired after the operation that the man was subject to hæmophilia, and had bled on previous occasions. In neither of these two cases were glands removed.

A man, aged 41, died of abscess of the lung and other signs of pyæmia on the thirty-fifth day after an extensive operation in which half the tongue and floor of the mouth, together with part of the lower jaw, were removed for epithelioma.

A man, aged 64, died of shock two days after a similar operation, in which part of the jaw was also removed.

The whole tongue was removed through a cervical incision in one case, the patient, a man, aged 70, making a good recovery.

In all cases the tongue was removed by scissors, and not by the écraseur.

OPERATIONS ON BURSÆ, FASCIÆ AND TENDONS.

The only death was that of a man of 59, who died of erysipelas and pneumonia seventeen days after the removal of a very large bursal tumour from the knee.

OPERATIONS ON THE LARYNX AND TRACHEA.

Tracheotomy for croup and diphtheria was performed forty times, with eighteen recoveries; of children under the age of 2 years seven died and four recovered (aged 20, 18, 16 and 11 months respectively).

A man, aged 49, with an epithelioma of the larynx, was relieved by tracheotomy, but died a month later with pleurisy and cystitis.

Another similar case (age 54) proved fatal eight months after the operation; secondary growths were found in the liver, lungs, and elsewhere.

A third man, aged 40, died at the beginning of the operation.

A boy, aged 8, recovered after tracheotomy and extraction of a piece of celluloid that had been in his larynx for five weeks.

A male infant, aged 7 months, died of broncho-pneumonia two months after a tracheotomy for dyspnœa, the cause of which had not been ascertained; at the post-mortem a large piece of mutton bone was found in the larynx.

A girl, aged 4, with extensive burns of the face and trunk, died of œdema of the glottis, six hours after admission. Tracheotomy was performed, but death ensued almost immediately afterwards.

OPERATIONS ON ARTERIES AND VEINS.

A man, aged 47, was admitted with a cirsoid aneurism of the hand and ulceration of the little finger. The brachial and ulnar arteries were tied simultaneously, and the aneurism cured. The ulceration, however, continued, and the finger was amputated. The patient left the hospital on the eighty-first day, completely cured, and when seen again, some months later, was found to have had no return of the disease.

The femoral artery was successfully tied in Hunter's canal on account of popliteal aneurism in a man, aged 30, and a woman, aged 51. Both patients were cured.

The superficial and deep femoral arteries, and the superficial femoral vein were all tied in the course of an operation for removal of a tumour of the thigh, from a man, aged 37. No gangrene ensued, and the patient recovered.

The external jugular vein of a woman, aged 21, was tied on account of a venous swelling as large as a walnut, just above the clavicle. Very little effect was produced by the operation.

Ligature of varicose veins was performed forty-two times without any bad result.

OPERATIONS ON GENITO-URINARY ORGANS.

Nephrotomy was performed seven times as an exploratory operation; in three cases of women, aged 42, 34 and 32, the kidney was found to contain pus, and was supposed to be tubercular; in a man, aged 45, and two women, both aged 41, calculus had been suspected, but was not found. All these cases recovered, the only death after nephrotomy being that of a man, aged 28, who was admitted with a sinus in the loin and symptoms of renal calculus; a stone had been removed from the bladder many years previously; no stone was found in the kidney, and the patient died of uræmia six days after the operation; there was no post-mortem.

Nephro-lithotomy was performed four times with success. One of the patients was a boy, aged 16, who was admitted with profuse hæmaturia, after an injury to the abdomen; the hæmaturia increasing, an incision was made down to the kidney. An extensive rupture was found, and in the pelvis was a large calculus. The latter was removed, and the patient made a good recovery. The other patients were men, aged 41 and 36, and a woman, aged 39.

Nephrectomy was performed three times.

A man, aged 26, was admitted with a large hydronephrosis which had existed for many years; he was very ill, and had a high temperature; abdominal nephrectomy was performed, and the cyst was found to contain a large quantity of blood. Profound collapse followed the operation, but the patient made an excellent recovery.

A man, aged 60, recovered after removal of the kidney, for sarcoma, by an abdominal incision.

A woman, aged 24, recovered after lumbar nephrectomy for cystic disease.

Nephrorraphy for moveable kidney was performed upon a man, aged 23, and three women, aged 32, 28 and 23. The man was known to be perfectly well more than a year later; one of the women was re-admitted a few weeks later, and the kidney was removed.

A man, aged 71, was admitted with cystitis, enlarged prostate, and vesical calculi; **lithotrity** was attempted, but as the stones could not be crushed the bladder was opened above the pubes; five stones were removed. The patient died two days later, and at the post-mortem both kidneys were found to be in a state of pyonephrosis. Four patients, aged 28, 24, 20 and 10, recovered after **supra-pubic lithotomy.**

Three patients died after **supra-pubic cystotomy** for tumour.

A man, aged 58, with profuse hæmaturia due to carcinoma of the prostate, died of shock and hæmaturia after partial removal of the growth by scraping.

A man, aged 65, with epithelioma of the bladder, was much relieved by the operation, but died some months later of extension of the disease causing suppuration in the iliac fossa.

A man, aged 58, was admitted on account of hæmorrhage from a villous tumour of the bladder of eight years' duration. The bladder was opened, the growth transfixed and removed. The bladder was sewn up, but the wound had to be re-opened on the fourth day. The patient gradually sank, and died of pyæmia on the fiftieth day after the operation. At the post-mortem, dilated and suppurating kidneys were found.

Lateral cystotomy was performed only once during the year, for hæmorrhage into the bladder after an internal urethotomy, upon a man, aged 32.

Median cystotomy was performed once upon a man, aged 46, for cystitis and suppuration, following internal urethrotomy.

Two men, aged 63 and 49, died of extravasation of urine after supra-pubic **tapping of the bladder** for retention due to enlarged prostate and stricture respectively.

Of three deaths after **internal urethrotomy**, two are mentioned above under cystotomy; the third case was that of a man, aged 34, who died of extravasation of urine and suppurative pyelitis on the sixteenth day after the operation.

OPERATIONS ON THE RECTUM AND ANUS.

The only death was that of a man, aged 59, who developed cystitis, and died ten days after ligature of a prolapsed rectum. At the post-mortem both kidneys were found to be in a state of pyonephrosis.

MISCELLANEOUS OPERATIONS.

A girl, aged 15, recovered after excision of a malignant pustule from the cheek.

Tubercular glands were excised, or erased, in fifty cases without a death.

An infant, aged 3 weeks, was successfully injected with Morton's fluid.

Another infant, aged 6 weeks, with spina bifida, was treated by excision of the sac; it developed hydrocephalus, but recovered sufficiently to leave the hospital three months later.

OPERATIONS FOR HERNIA.

Herniotomy for strangulation was performed twenty-seven times with eleven deaths.

Of the fatal cases, in six the operation was done on women for femoral hernia.

A woman, aged 76, with strangulation of seventeen hours, died in two days of hypostatic congestion of the lungs. A woman, aged 66, with strangulation of five days, died two hours after operation from perforation of the intestine. A woman, aged 65, with strangulation of five days, died in two days; the intestine was gangrenous at the operation, and was laid open.

A woman, aged 64, with strangulation of about thirty hours, died in three days. At the operation, the gut was found to be gangrenous, and four inches were resected by Maunsell's method ; symptoms of peritonitis being present on the third day, abdominal section and enterotomy were performed with but temporary relief, the patient dying shortly afterwards. At the post-mortem much constriction of the bowel was found at the seat of operation. A woman, aged 47, with strangulation of three days, did fairly well for several days after the operation, then became cataleptic and delirious, and died on the twenty-third day. At the post-mortem the wound was found soundly healed, but the gall-bladder contained numerous calculi, some of which had perforated its wall and set up a fatal peritonitis. A woman, aged 43, with strangulation of four days, died in three hours of exhaustion. At the post-mortem there was no perforation or peritonitis, but the kidneys showed slight interstitial nephritis.

A man, aged 63, with a femoral hernia that had been strangulated for three days, died on the seventh day ; there was no post-mortem.

Three patients died after herniotomy for inguinal hernia.

A man, aged 39, with an omental hernia that had been strangulated for several days, died of pyæmia ten days after the operation. A man, aged 51, with a large inguinal hernia and strangulation of nine hours, died on the fifth day. At the post-mortem several inches of gut were found gangrenous and perforated. A man, aged 72, with strangulation of three days, died in two days. At the post-mortem much emphysema and congestion of both lungs was found, and also chronic interstitial nephritis ; there was no peritonitis.

One patient died after herniotomy for umbilical hernia ; he was a man, aged 46, with strangulation of about twenty-four hours ; he died in three days, of peritonitis.

Of the sixteen cases that recovered after herniotomy, five were women with femoral hernia ; their ages varied from 77 to 39, and the duration of the strangulation from six days to a few hours. One of these cases was that of a woman, aged 50, who, after an operation for strangulation of three days, did well until the fifteenth day, when she complained of abdominal pain and vomiting ; these symptoms continued on and off until the twenty-fifth day, when they became so severe that the abdomen was opened. A band of adhesion was found constricting a portion of small intestine ; it was divided, and the patient made an excellent recovery, leaving the hospital on the seventy-fourth day.

Ten male patients recovered after herniotomy for inguinal hernia. In the case of a man, aged 24, the appendix vermiformis was found in the hernial sac ; its tip, being gangrenous, was removed, and the patient made a good recovery.

A woman, aged 30, recovered after herniotomy for umbilical hernia.

A man, aged 62, recovered after an operation for an inguinal hernia that had been reduced *en masse*.

The operation for radical cure of reducible hernia was performed ninety-nine times upon seventy-nine male and twenty female patients.

One patient, a boy, aged 6, died of scarlet fever on the tenth day after operation.

Two male patients, aged 67 and 16, became insane after the operation, but the younger patient had nearly recovered before he left the hospital.

In one case, that of a man, aged 43, a fœcal fistula formed, but healed before he left the hospital.

The operation for **radical cure of irreducible** non-strangulated hernia was performed twenty-two times on ten male and twelve female patients without a death.

COLOTOMY.

A man, aged 52, died on the seventy-fourth day after inguinal colotomy, of suppuration in the pelvis in connection with a very foul carcinomatous growth of the rectum.

A woman, aged 49, was admitted with ascites, supposed to be due to malignant disease of the rectum. Symptoms of obstruction supervening, inguinal colotomy was performed, and the symptoms were found to be due to acute supervening upon chronic peritonitis. At the post-mortem it was found that the peritonitis was due to chronic simple ulceration of the stomach.

Lumbar colotomy was not performed at all during the year.

ABDOMINAL SECTION.

A man, aged 64, was admitted with several self-inflicted punctured wounds of the mesentery. These were sewn up, but the man died two days later of shock and hæmorrhage.

A woman, aged 26, died two days after abdominal section for acute tubercular **peritonitis.**

A woman, aged 35, died after abdominal section for a localised tubercular peritonitis. At the post-mortem tubercle was also found in the pleura.

A married woman, aged 40, was suddenly seized with violent abdominal pain followed by vomiting, constipation and abdominal distension ; two days later, the symptoms continuing, the abdomen was opened ; acute peritonitis was found with free gas and some pus in the pelvis. No perforation or other cause for the peritonitis was discovered. The intestines were punctured in three places, and the punctures sewn up. The abdomen was then closed and drained for twelve days ; the patient eventually recovered completely, leaving the hospital three months after admission.

A German Jew, aged 55, was admitted very ill with acute peritonitis and symptoms pointing vaguely to intestinal obstruction. The abdomen was opened and found to contain free gas, lymph and serous fluid. The distended intestines were incised in several places, the contents evacuated, and the wounds then sewn up ; the abdomen was washed out and closed. The patient died a few hours afterwards. At the post-mortem three **gastric ulcers** were discovered, one of which, on the anterior surface of the stomach, had perforated.

A woman, aged 20, was admitted with symptoms of perforated gastric ulcer ; the abdomen was opened sixteen hours after the onset of symptoms, a perforation discovered close to the cardiac end of the stomach ; the latter was washed out, the ulcer was scraped and sewn up, and the peritoneal cavity thoroughly washed out. Death occurred fifteen hours later.

A man, aged 25, was admitted with acute peritonitis. Six days before admission he was suddenly seized with severe abdominal pain. The abdomen was opened, and a large quantity of fœtid pus let out. Death occurred four days later. At the post-mortem a perforated ulcer was found on the upper surface of the **duodenum,** close to the pylorus.

In the case of a man, aged 61, with similar symptoms lasting six and a half hours, an ulcer on the anterior wall of the duodenum was discovered by abdominal section and sewn up, but the patient died of peritonitis on the third day.

A woman, aged 39, died on the day after an abdominal section for peritonitis caused by perforation of a portion of intestine that had been strangulated by a band of old peritoneal adhesions.

A soldier, aged 22, who had had dysentery and ague three years before, was admitted very ill, complaining of shivering and pain over the liver and abdomen ; these symptoms had lasted for six weeks. The abdomen was opened and washed out, general peritonitis having been found. The patient died on the fourth day. At the post-mortem a large **abscess of the liver** was found, and extensive dysenteric ulceration of the colon.

A man, aged 23, with an abscess of the liver, made an excellent recovery after resection of two ribs and drainage of the abscess.

A sailor, aged 22, was admitted with a large fluid swelling in the upper part of the abdomen. This was opened, and found to contain coffee-coloured fluid mixed with pus, which appeared to be in the lesser peritoneal cavity. The wound did not heal satisfactorily, and another opening was made subsequently through the chest wall. The patient left the hospital with sinus still open. The exact nature of the disease was never clearly ascertained.

A woman, aged 40, was admitted with intra-peritoneal pelvic abscess, which was opened and drained; she subsequently died of a second abscess, which was found post-mortem to lie behind the ascending colon, below the liver and diaphragm, and outside the kidney and duodenum ; the cause of the suppuration was a retained and sloughing piece of placenta.

A woman, aged 37, died shortly after abdominal section and enterotomy for **acute intestinal obstruction.** At the post-mortem about two feet of small intestine were found to have been strangulated by a ring formed of two appendices epiploicæ, united by their tips. The other case of abdominal section for acute intestinal strangulation recovered, and has already been mentioned under operations for hernia.

The abdomen was opened twice for **intus-susception.** In the case of a male infant, aged 5 months, the intus-susception was not found, and the patient died next day. At the post-mortem an ileo-cœcal intus-susception was found deep-seated in the left hypochondrium.

The second case was that of a female infant, aged 9 weeks, with an intus-susception of at least three days' duration ; at the operation about six inches of gut was found to be invaginated ; all was reduced except the last inch ; in attempting the reduction of this the bowel ruptured, and an artificial anus had to be made. The child died within an hour or two.

Two male and one female children recovered after reduction of the intus-susception by injection ; two of them were under 1 year of age. A fourth child, aged 6, with apparently characteristic symptoms of intus-susception, recovered spontaneously.

Three patients recovered after removal of the **appendix** for inflammation ; in one of these cases a pin, in another a fœcal concretion, was found.

A boy, aged 14, was admitted with symptoms of appendicitis of two months' duration ; for three days there had been absolute constipation and distension, and shortly before admission he became collapsed. General peritonitis was found at the time of operation, due to the rupture of an abscess connected with a sloughing vermiform appendix. The patient died soon after the operation.

A man, aged 20, and a boy, aged 14, died after operations for a similar condition.

A girl, aged 14, died after an operation for perityphlitic abscess, the symptoms of which had lasted for a fortnight. At the post-mortem it was found that the origin of the suppuration was a large pin lodged in the appendix.

A woman, aged 60, recovered after laparotomy and **enterotomy** for chronic intestinal obstruction due to carcinoma of the cæcum. A woman, aged 64, died after enterotomy performed for distension, following resection of a gangrenous hernia.

A man, aged 34, from whom the cæcum and part of the ascending colon had been removed for carcinoma eight months previously (see last year's report), was re-admitted with recurrence of the disease and symptoms of obstruction. The ileum was opened, with temporary relief, the patient dying five weeks later with extensive deposits of malignant disease in various parts of the abdomen.

Enterotomy was also performed successfully upon a man, aged 58, with chronic intestinal obstruction, probably due to malignant disease.

A man, aged 29, with peritonitis and intestinal obstruction due to carcinoma of the sigmoid flexure, died after an enterotomy, as did also a man, aged 43, with a similar disease of the transverse colon.

A woman, aged 35, with intestinal obstruction following hysterectomy, recovered, and subsequently underwent enterectomy for the cure of the fœcal fistula.

A woman, aged 39, died after enterotomy for a similar condition. The post-mortem showed no obvious cause of death.

Enterectomy was performed three times. A woman, aged 30, with acute intestinal obstruction of three days' duration, underwent resection of several inches of gangrenous small intestine and the formation of an artificial anus, but died soon afterwards.

A woman, aged 35, recovered after enterectomy for fœcal fistula (described more fully under plastic operations).

A woman, aged 42, died three days after resection of a portion of the sigmoid flexure for carcinoma and obstruction. At the post-mortem it was found that some of the stitches had given way from pressure of fœces above the seat of obstruction. In none of these cases of enterectomy was any "button" or other mechanical appliance used to unite the intestine.

Gastrostomy was performed twice; successfully upon a man, aged 65, for malignant disease of the œsophagus; the patient died at home of the original disease several months later; unsuccessfully upon a man, aged 56, who was admitted in a starved and dying condition with the same disease, and who died of exhaustion two days after the operation.

Gastro-jejunostomy was performed upon a woman, aged 37, who was admitted on account of constant vomiting due to carcinoma of the pylorus. Senn's plates were used at the operation, which lasted forty minutes. The patient did well for four days, then the temperature began to rise and the abdomen became distended. Death occurred on the sixth day. At the post-mortem it was found that slight leakage had taken place at the seat of one of the sutures.

Local removal of uterine fibroids by abdominal section. A woman, aged 34, with a suppurating uterine fibroid, died after a partial removal of the tumour. Another woman, aged 53, died of shock a few hours after removal of fibroids weighing twenty-five pounds.

Four patients died after abdominal **hysterectomy** for fibroid ; one was a woman, aged 49, with a large suppurating tumour. At the post-mortem, suppuration of the jugular vein was found to have been present before the operation. A very feeble and anæmic woman, aged 45, died of pulmonary thrombosis. A woman, aged 44, died of peritonitis. In the fourth case, of a woman, aged 39, symptoms of obstruction followed the operation, and enterotomy was performed (see above).

After **ovariotomy**, twenty-nine patients recovered and two died. One of these cases was that of a woman, aged 53, admitted with acute peritonitis from an inflamed cyst. The operation was done from reasons of urgency, but the patient died next day ; there was no post-mortem. The other case was that of a woman, aged 61, who recovered from the operation itself, but died of bronchitis five weeks afterwards.

Exploratory abdominal section. A woman, aged 31, died of tubercular disease of the ovary and kidney several weeks after an exploratory incision had been made into the abdomen for pelvic suppuration.

A man, aged 25, was admitted with a swelling in the iliac fossa ; an exploratory abdominal section proved it to be an abscess : the peritoneal cavity was then closed, and the abscess opened extra-peritoneally. The patient eventually left the hospital with a sinus ; the exact cause of the suppuration was never ascertained.

The abdomen of a woman, aged 24, was opened on account of multiple hydatids of the peritoneum ; the tumours, however, were found to be too numerous and too fixed to permit of removal, and the patient left the hospital without further operation.

A man, aged 43, was admitted with symptoms of obstruction due to malignant disease of the transverse colon ; an exploratory laparotomy was followed by relief, which lasted, but the man eventually underwent colotomy, and died before leaving the hospital. In the case of another man, aged 31, with carcinoma of the colon, an exploratory laparotomy was followed by a successful colotomy.

A woman, aged 70, recovered after an exploratory laparotomy which revealed cancer of the kidney unfit for further operation.

A similar operation upon a man, aged 60, showed cancer of the stomach and peritoneum too extensive for further operation. In the case of a woman, aged 53, with a very large abdominal tumour, an exploratory operation showed a retro-peritoneal growth too closely adherent to intestine to permit of removal ; both these patients recovered from the operation, and left the hospital.

The two cases of abdominal section for rupture of the duodenum and gall-bladder have been described already in the appendix to Table I.

SUB-TABLE, SHOWING THE NUMBER OF CASES OF ERYSIPELAS, PYÆMIA, &c., IN THE SURGICAL WARDS.

DISEASES.	Under 5.		5—10.		10—20.		20—30.		30—40.		40—50.		50—60.		60—70.		70—80.		TOTAL.		Deaths.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
CUTANEOUS ERYSIPELAS—																						
Admissions	4	3	2	3	2	4	6	5	2	5	2	4	1	4	1	1	...	...	20	29	...	**1**
Occurring in Hospital	...	...	...	1	1	...	1	...	...	1	1	...	2	1	...	...	...	...	5	3	...	...
Occurring after operation	...	1	...	...	1	1	1	...	1	1	1	...	...	...	1	...	...	...	5	3	...	...
PHLEGMONOUS ERYSIPELAS AND CELLULITIS—																						
Admissions	9	...	2	2	12	5	17	2	14	2	18	8	11	3	1	3	1	1	85	26	**9**	**1**
Occurring in Hospital	...	...	...	...	...	...	...	...	2	1	1	...	...	...	...	...	...	...	3	1	**1**	...
Occurring after operation	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	**1**	...
PYÆMIA AND SEPTICÆMIA—																						
Admissions	1	2	1	...	4	...	1	1	...	...	2	...	...	1	...	...	...	...	9	4	**6**	**4**
Occurring in Hospital	...	1	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	2	1	**2**	**1**
Occurring after operation	...	...	...	...	...	...	...	...	1	...	1	1	1	...	...	...	...	...	3	1	**3**	**1**
DELIRIUM TREMENS—																						
Admissions	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1	...	...	...
Occurring in Hospital	...	...	...	...	...	...	...	1	2	...	1	...	2	1	1	...	...	...	6	2	**2**	...
Occurring after operation	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	**1**	...

APPENDIX TO SUB-TABLE OF CASES OF ERYSIPELAS, &c.

ERYSIPELAS—Cutaneous.

Admissions.

Only one patient died ; this was a female infant, aged 4 weeks, who was admitted for facial erysipelas, developed symptoms of septicæmia, and died in less than a fortnight. The post-mortem showed both pericarditis and peritonitis.

Occurring in Hospital.

Five male and three female patients developed the disease after admission for wound of face, wound of scalp, ulcer of leg, fistula, tubercular knee, tubercular hip, burn of leg, and a broken arm respectively. All recovered.

After Operations.

In five male patients after erasion of lupus, division of fistula, plastic operation on the face, removal of tongue, amputation of ulcerated finger. Also in three female patients after cauterisation of a nævus of the cheek and the opening of abscesses of the breast and hip. All recovered.

Phlegmonous.

Admissions.

Nine male and one female patient died. A male infant, aged 5 weeks, died of pulmonary collapse on the fourth day after admission for cellulitis and sloughing of the abdominal wall.

A boy, aged 1 year, admitted with cellulitis of the leg, died a week later of broncho-pneumonia.

A boy, aged 11, was admitted with cellulitis of the orbit, and died a few days afterwards. At the post-mortem extensive meningitis and thrombosis of cerebral sinuses were found.

A man, aged 19, admitted for cellulitis and suppuration of the knee following a lacerated wound, died after amputation through the thigh.

A man, aged 44, admitted with phlegmonous erysipelas following a wound of the leg, had extensive suppuration, and died three months after admission. The immediate cause of death was syncope during the administration of chloroform, preparatory to the opening of an abscess.

A carman, aged 49, died four days after admission of cellulitis of the legs and septicæmia, due to neglected perforating ulcers of both feet.

A greengrocer, aged 48, died of suppurative arthritis of the knee, peritonitis, and septicæmia, three months after admission.

A labourer, aged 68, admitted for cellulitis of the leg, died four days afterwards of cerebral hæmorrhage.

A cabinet-maker, aged 74, admitted with extensive ulceration and cellulitis of the lower limb, died after amputation through the thigh.

A woman, aged 61, died, a few days after admission, from cellulitis of the neck and diabetes.

Occurring in Hospital.

A man, aged 35, died of cellulitis following extravasation of urine. Two other men, aged 38 and 43, developed erysipelas after admission for a urinary fistula and a gumma of the face. Both recovered, as did also a woman, aged 38, who developed the disease after admission for a suppurating bursa patellæ.

After Operation.

Only one case occurred, that of a man, aged 59, who died after removal of a very large bursa patellæ.

PYÆMIA AND SEPTICÆMIA.

Admissions.

A man, aged 41, who had recently, against advice, discharged himself from the hospital on the third day after a severe operation for cancer of the tongue, was re-admitted with septic pneumonia, and died four days later.

Five other male patients died of septicæmia complicating necrosis of jaw, necrosis of femur, empyema of antrum and otitis media (two cases).

Three male patients recovered from pyæmia complicating necrosis of ilium and suppurative arthritis of knee and elbow.

Three female patients died of pyæmia and septicæmia complicating necrosis of the femur, suppuration in the knee, and abscess of the neck, while a fourth died from pyæmia, of which the cause could not be ascertained.

Occurring in Hospital.

Two men, aged 31 and 48, and a female infant, aged 4 weeks, died of septicæmia which developed after admission for erysipelas of the leg, compound fracture of the jaw, and erysipelas of the face.

After Operations.

Three men, aged 39, 41, and 58, and one woman, aged 44, died of pyæmia or septicæmia after operations for strangulated hernia, cancer of tongue involving lower jaw, papilloma of bladder, and ulcerated scirrhus of the breast.

DELIRIUM TREMENS.

Admissions.

One man, aged 49, recovered after delirium tremens and erysipelas.

Occurring in Hospital.

Two men died, and four men and two women recovered, from delirium tremens which developed after admission for fractured ribs, fractured tibia and fibula, fractured femur, fractured tibia (two cases), stricture of urethra, fractured tibia, and compound dislocation of astragalus.

After Operations.

A man, aged 66, died of delirium tremens after removal of half the tongue for cancer.

TABLE OF AMPUTATIONS WITH THE PERCENTAGE OF DEATHS DURING THE TEN YEARS

from 1885 *to* 1894 *inclusive.*

OPERATIONS.	CASES UNDER TREATMENT.										PERCENTAGE OF DEATHS.										Total Number of		Average Percentage of Deaths.
	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	Cases.	Deaths.	
PRIMARY—																							
Thigh	2	2	2	2	2	2	1	2	1	1	100·	...	50·	...	50·	100·	100·*	50·	...	...	17	**8**	47·05
Knee-Joint	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Leg	3	1	3	2	1	1	2	3	2	...	33·3	100·	66·66	50·	...	...	...	...	...	...	18	**5**	27·22
Ankle-Joint	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	100·	...	...	...	...	3	**1**	33·33
Shoulder-Joint ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Arm	4	2	2	...	2	1	6	...	1	1	25·	...	...	...	50·	100·	...	...	...	...	19	**3**	15·76
Forearm	2	3	2	4	1	...	...	2	3	...	...	...	...	...	...	...	...	50·	33·33	...	17	**2**	11·76
SECONDARY—																							
Thigh	5	...	...	4	1	3	...	...	2	1	...	...	...	25·	100·	33·33	...	...	...	...	16	**3**	18·75
Leg	3	2	1	1	1	...	...	2	...	...	66·66	...	100·	...	...	...	...	...	...	...	10	**3**	30·
Arm	...	...	1	1	1	...	1	1	...	...	...	...	...	...	...	...	...	100·	...	...	5	**1**	20·
Forearm	3	1	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	...	...
Shoulder-Joint ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

* *Foot also amputated.*

OPERATIONS.	CASES UNDER TREATMENT.										PERCENTAGE OF DEATHS.										Total Number of		Average Per-centage of Deaths.
	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	Cases.	Deaths	
FOR DISEASE—																							
Hip-Joint	1	3	...	1	...	...	...	1	1	2	100·	66·66	...	...	...	...	...	...	...	50·	9	**4**	44·44
Thigh	20	12	25	15	13	7	13	14	10	19	10·	...	12·	13·33	7·69	14·28	7·69	14·2	10·	5·26	148	**14**	9·45
Knee-Joint	1	...	1	1	1	...	2	2	1	1	...	...	...	...	...	...	...	...	...	100·	10	**1**	10·
Leg	4	8	5	7	7	4	6	6	11	6	50·	...	20·	14·28	14·28	...	...	...	...	...	64	**5**	7·80
Ankle-Joint	11	9	11	6	1	6	...	4	5	6	...	22·22	9·09	...	...	16·66	...	...	...	...	59	**4**	6·77
Shoulder-Joint ...	1	1	1	1	...	...	...	3	1	...	100·	...	...	...	...	...	...	33·33	...	...	8	**2**	25·
Arm	1	4	2	...	2	5	4	2	1	3	...	25·	...	...	...	...	...	...	...	...	24	**1**	4·16
Forearm	2	5	5	2	4	...	...	4	1	2	100·	20·	...	...	...	...	...	...	...	...	25	**3**	12·

INDEX.

TO REGISTER OF POST-MORTEM EXAMINATIONS.

SURGICAL, 1894.

* The figures refer to the pages of the Surgical Post-mortem Register, kept in the Library.

LONDON :
PRINTED BY CHARLES SKIPPER AND EAST,
49, GREAT TOWER STREET, E.C.