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# SAINT BARTHOLOMEW'S HOSPITAL REPORTS.

A

## CONTRIBUTION TO THE MINUTE ANATOMY OF THE ORGAN OF JACOBSON.

BY

E. KLEIN, M.D., F.R.S.

The organ of Jacobson of mammals, as is well known, is situated bilaterally in the lower or osseous part of the septum narium, about the region of the incisors. Its general morphology and development has been studied by Gratiolet,[1] Born,[2] and Fleischer.[3] Its minute structure is, however, little known. A rudiment of the organ of Jacobson exists also in man, as Dursy, and especially Kölliker,[4] very clearly proved. Kölliker found it in the fœtus, in the child, and also in the adult; and in this last instance he identified it as the duct described by J. Fr. Meckel and by Sömmering in the lower part of the nasal septum. But about its histology Kölliker does not give any detailed account, owing to the want of suitable material. I have investigated the structure of the organ of Jacobson of the adult guinea-pig, in specimens suitably prepared for microscopic examination, and I am thus enabled to give a detailed account of the parts composing it. In this animal, the shape of the organ of Jacobson

[1] Recherches sur l'organe de Jacobson. Paris, 1845.
[2] Sitzungsb. d. naturw. Section, August 1877, Schlesische Ges. f. vaterl. Cultur
[3] Sitzungsb. d. phys. med. Societät. Erlangen, 1877.
[4] Gratulationsschrift an Fr. v. Rinecker. Leipzig, 1877.

resembles that of man, as described by Kölliker, being a tubular structure, flattened from side to side, opening into the ductus Stenonianus, but its diameter is much larger than that of the latter. It terminates in a cæcal extremity. It is surrounded, not by the bone of the septum, but by hyaline cartilage. This latter is, however, altogether independent of the cartilage forming the front part of the nasal septum. The cartilage surrounding the organ of Jacobson forms a more or less complete capsule around the latter; but there are a great many places where the cartilaginous capsule is incomplete, and then the wall of the organ of Jacobson is in immediate contact with the bone or rather its internal periosteum. This incompleteness affects more generally the lateral and lower than the median and upper parts. The cartilage for each organ always projects upwards as a plough-shaped plate, showing an outer convex and an upper concave surface. The connective tissue, *i.e.*, the perichondrium, covering this latter surface, is at the same time the tissue by which the convex border of the cartilaginous part of the nasal septum is fixed here.

The plough-shaped plate of the cartilage of the organ of Jacobson of each side contains a spacious longitudinal channel for the branches of the nerves and blood-vessels supplying that organ.

As mentioned above, the organ of Jacobson is flattened, and therefore its walls are generally considered as the lateral and median wall, the latter being the one nearest to the median line of the septum. For a better understanding, we shall speak of an upper and lower sulcus, meaning the parts where the lateral and median wall are in contact. In the guinea-pig, the outline of the transverse section is not simply oval, but is kidney-shaped, the lateral wall being pressed inwards, *i.e.*, against the lumen or cavity of the organ. The size of the organ is about the same on both sides.

The following are the measurements of the different diameters, taken at a point where the cartilaginous capsule is more or less incomplete at the outer and lower part of the organ :—

| | mm. |
|---|---|
| The transverse diameter of the whole organ, exclusive of the cartilage or bone, is about . . . . . | 0.72 |
| The longitudinal diameter of the whole organ across the upper and lower sulcus is about . . . . | 1.7 |
| The thickness of the lateral wall, . . . . | 0.28–0.38 |
| „ „ median wall, . . . . . | 0.14 |
| The transverse diameter of the cavity, . . . . | 0.3 |
| The long diameter, *i.e.*, from the upper to the lower sulcus, | 0.77 |

The thickness of the wall at the lower sulcus is about the

same as that of the lateral wall, while that of the wall at the upper sulcus is slightly larger than that of the median wall.

As regards the structure :

1. *The lateral wall.* This consists of (*a*) the epithelium lining the cavity ; (*b*) the subepithelial fibrous layer ; (*c*) the layer of the cavernous tissue ; (*d*) the layer of glands. Outside these is the thin layer of fibrous tissue connecting the organ with the cartilage, or, where this is wanting, with the bone, which acts as the perichondrium or inner periosteum respectively.

(*a.*) *The epithelium* is in all respects similar to that lining the mucous membrane of the nasal cavity, being composed of a superficial layer of columnar or conical cells, between the extremities of which extend spindle-shaped or inverted conical cells, *i.e.*, cells with their bases turned away from the free surface. Each of these cells possesses an oval nucleus. The superficial conical cells show on their free surface a bundle of fine cilia. The whole thickness of the epithelium, inclusive of the cilia, is 0.064 mm. ; the length of the cilia is 0.0054 mm. Loewe[1] failed to see the cilia on the epithelium of the lateral wall of the organ of Jacobson in the rabbit ; but I presume this is entirely owing to the mode of preparing the specimens, since I cannot conceive that there should exist such an essential difference between the rabbit and guinea-pig. Some of the superficial epithelial cells present themselves as goblet cells.

(*b.*) A very delicate basement membrane separates the epithelium from the next, or the *subepithelial fibrous layer.* This layer is chiefly composed of bundles of fibrous tissue, and in it are capillary vessels, and here and there a thin bundle of unstriped muscle cells. The thickness of this layer varies in different places; in the middle of the lateral wall it is about 0.032 mm.

(*c.*) The next outer layer is the *layer of the cavernous tissue.* This layer is thickest about the middle of the lateral wall; it is altogether wanting near the upper and lower sulcus. The thickness-diameter is about 0.12 mm. ; but where the cartilage capsule is wanting, the thickness of this layer is much greater, being 0.22 mm. The length of this layer varies between 0.43 and 0.61 mm. The matrix of this layer is fibrous tissue, containing a plexus of bundles of unstriped muscle cells. The essential parts are large venous vessels connected into a plexus, the vessels running chiefly parallel to the long axis of the organ ; hence in a transverse section most of them appear cut transversely. The transverse diameter of the vessels varies between 0.046 and 0.092 mm. ; where the cartilage capsule is wanting,

[1] Beitr. zur. Anatom. d. Nase und Mundhöhle. Berlin, 1878.

some of the vessels are as large as 0.16 mm. in diameter. These vessels take up the venous capillaries of the subepithelial fibrous layer, as well as some of those of the next outer glandular layer. The efferent veins of the cavernous layer are smaller than the vessels of this layer, a character essential for a cavernous tissue.

(*d.*) The *layer of glands* is the next outer layer. It consists of a wide-meshed framework of connective tissue, the meshes containing the gland-alveoli. This layer is thickest at the lower sulcus, where its diameter amounts to 0.22–0.28 mm. Here it occupies at the same time the whole thickness of the wall, there being here no cavernous layer. About the middle of the lateral wall the thickness-diameter of the gland layer is about 0.08 mm. It decreases towards the upper sulcus, where it becomes reduced to a single layer of alveoli.

The gland-alveoli are not confined to the lateral wall and to the membrane at the lower sulcus, but extend at this latter place also a short distance into the median wall. The alveoli are branched and more or less convoluted tubes of exactly the same nature as the serous glands, *e.g.*, the parotid; they are limited by a membrana propria; they possess a very minute lumen, and are lined with a single layer of polyhedral or short columnar epithelial cells, each with a spherical nucleus, situated in the outer part of the cell. The cell substance is a dense reticulum, and therefore appears as a uniformly granular protoplasm. The outline of the alveoli is not smooth, but shows numerous minute rounded prominences, owing to some of the epithelial cells possessing a convex outer surface; and it is just in these cells that the projecting convex part of the cell appears more coarsely granular than the inner part of the cell substance, and hence the appearance produced is not dissimilar to the crescents of the submaxillary gland of the dog. In some places, however, the outer part of the cell, *i.e.*, that containing the nucleus and next the membrana propria, appears uniform and stains better in dyes than the rest of the cell—an appearance very similar to that of the cells of the pancreas. The alveoli open directly into short ducts; they are lined with a single layer of columnar epithelial cells. In some instances the outer portion of the cell substance appears longitudinally striated, just like those in the salivary ducts of Pflüger. The ducts open with a narrow mouth into the lower sulcus, where the columnar ciliated cells of the lateral wall pass into the mouths of the former. And these mouths form indeed the boundary between the epithelium of the lateral and that of the median wall. I have seen specimens where a duct opening in the lower sulcus with a narrow mouth became much distended behind this, and extended in this state

into the wall of the organ at the lower sulcus to a depth of about 0.22 mm., and throughout this whole length it was lined with columnar ciliated epithelium.

2. *The median wall;* as such is to be considered that part of the circumference of the organ which is not strictly limited to the median line of the nasal septum, but which is covered with a thick epithelium; this, owing to its peculiar nature,[1] is the "sensory epithelium."

The median wall comprises much the greater half of the circumference of the organ, extending almost over two-thirds of the whole circumference. The thickness is about 0.14 mm.; at the lower sulcus it decreases slightly. The most conspicuous feature in this is the sensory epithelium; its thickness is 0.1 mm. What is not epithelium, *i.e.*, outside this latter, is fibrous tissue, intimately connected with the perichondrium or internal periosteum respectively. Numerous small nerve branches are contained in the subepithelial layer, and here they may be followed as oblique or longitudinal bundles, ultimately ascending into the sensory epithelium. These bundles are derived from large branches, which are contained as groups, in company with blood-vessels, in the channels of the plough-shaped upper part of the cartilage above mentioned. Most of the nerve bundles are derived from the olfactory nerve, and, like it, are composed of non-medullated fibres, but there are a few small bundles of the nervus naso-palatinus. As has been mentioned above, the gland-alveoli, at the lower sulcus, extend a short distance into the median wall.

The *sensory epithelium* extends over the whole of the median wall proper and the greater part of the adjacent superior and inferior sulci. Its structure is this: most superficially, the epithelium, as a whole, presents a faintly longitudinally striated substance, the striæ being due to thinner or thicker granular-looking columnar bodies. These, on careful examination with high powers, prove to be either the thinner or thicker processes of the deeper cells, reaching up to the surface; or conical thin epithelial cells, whose bases form part of the general surface. Each of these epithelial cells appears to be possessed of a narrow, oval, transparent nucleus. The conical cells are the "epithelial cells," and they are smaller and thinner, and their nucleus less distinct than the "epithelial" cells of the olfactory epithelium of the nasal cavity. Below the layer of the epithelial cells are several layers of comparatively large spherical nuclei, well outlined, and containing a delicate reticulum. Each of these nuclei belongs

[1] Balogh, Vienna Sitzungsberichte d. Akad. d. Wiss., 1860.

to a spindle-shaped, granular-looking cell, of which one process, the outer one, is broad, but thinner than an epithelial cell, and extends as one of the above striæ between the "epithelial cells" up to the free surface, while the inner is very delicate, and directed inwards. These spindle-shaped cells will be spoken of as the "sensory cells." The amount of cell substance around the nucleus is always appreciably larger than in the "olfactory cells" of the olfactory region, with which they are evidently analogous. The sensory cells vary much in size, some being nearly twice as bulky as others; the latter possess also a larger nucleus than the former. They are generally arranged in a number of layers, 5 to 12 and more, either uniformly occupying the lower half or two-thirds of the whole epithelium, or they form groups of 4, 5, and more. There exists a great difference in different parts as regards the extent to which the sensory cells reach towards the surface, for there are many places in which only a narrow strip of 0.027 mm. (the whole thickness of the epithelium being 0.1 mm.), *i.e.*, only a fourth of the whole epithelium is free of them, while in other places they occupy only a layer of 0.054 mm., or about one-half of the whole epithelium. But it must not be therefore supposed that in the latter places the epithelial cells are much longer than in the former. This is not by any means the case; on the contrary, in the places where the sensory cells reach very near to the surface, the "epithelial cells" are, if not wholly absent, reduced in number to a very great extent; the outer processes of the sensory cells almost entirely occupy their places. Towards the sulcus, superior and inferior, the epithelium, as a whole, decreases in thickness; at the sulcus, the epithelial cells become very few, and the sensory cells almost entirely form the layer. There exists a very sharp boundary between the sensory epithelium and the ciliated columnar epithelium of the lateral wall, as mentioned above. The sensory epithelium at the extremities of the median wall is either rounded off or it terminates with a pointed margin. On the surface of the sensory epithelium is a delicate cuticle, similar to the cuticle of V. Brunn in the olfactory region. Both the processes of the sensory cells and the basis of the epithelial cells appear to project over the cuticle, the former as a very minute thread, and the latter as a minute knob-like homogeneous process.

Amongst the deeper parts of the sensory epithelium are seen either small bundles of nerve fibres or isolated fine fibres, both extending in an oblique direction. The termination of the nerves has not been ascertained.

On the whole, then, this sensory epithelium corresponds to the olfactory epithelium, except that in the latter there exists a deep

layer of inverted conical "epithelial cells," *i.e.*, cells whose basis is fixed on the subepithelial basement membrane. In the sensory epithelium of the organ of Jacobson that deep layer of inverted conical epithelial cells is apparently wanting, the sensory cells reaching as far down as the subepithelial fibrous coat. Besides, as mentioned above, the "epithelial cells" of the sensory epithelium in the organ of Jacobson are much smaller than those of the olfactory epithelium, while the bodies of the sensory cells appear larger than those of the olfactory cells.

I cannot say precisely what the function of the organ of Jacobson is, since I have not made any experiments on this point. Kölliker thinks (l. c., p. 11) that "if we do not assume that the tubes of Jacobson are simply secretory organs—their vascular richness, their numerous glands, and the numerous branches of the nervus naso-palatinus seem to point to it; but against this speaks their supply with very numerous olfactory nerve fibres —there remains nothing else but to assume *that they* (Jacobson's organs) *secrete juices and substances which act on their specific nerves, and thus enable the organism, directly as it were, to obtain knowledge of the chemical constitution of its own juices.*" Whatever may be the precise meaning of this view of Kölliker's, it seems strange to have recourse to such a theory. Why should it not serve for the perception of specific smells, seeing that it really belongs to the olfactory nerve termination? In man the organ of Jacobson is only of a rudimentary nature (Kölliker) as compared with that of mammals. Do not these latter possess the power of smell to such a degree that human beings can hardly have a true conception of its nature?

ON SOME

# INTESTINAL LESIONS IN THE INSANE.

BY

T. CLAYE SHAW, M.D.

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The irregularities of digestion, which are so common in all forms of disorders of the nervous system, have led me to examine post-mortem the structure of the intestines in the insane, with the result that I have met with lesions so constant and of so profound a nature, that many of the serious symptoms observed during life may be directly connected with, and interpreted by them, and a clue obtained to a more rational line of treatment both by diet and medicine. It is to the chronic insane that my remarks more especially refer, to those suffering from the advanced stages of decay known as "dementia," and to those in the last stages of "general paralysis;" but I have seen and can recognise the earlier symptoms of these lesions in many suffering from acute insanity, and in persons who are not insane, but in what is described as "a nervous condition." Beyond a casual remark in Griesinger, that ulceration is common in the intestinal canal, I am not aware that much attention has been paid to the subject. The function of digestion contains in it an element of adjusted time movements, a harmony in the time-rate of muscular contractions of the stomach and various parts of the intestines. Any alteration in the time-rate of the stomach, whether from irritation or torpor, results in vomiting, diarrhœa, or indigestion, and the same occurs from an alteration of the time-rate of the intestines. There can be no doubt that the influence of the nervous system in controlling the sequence of intestinal movements is pre-eminent, and that the harmony of action of these parts depends essentially upon a properly co-ordinated flow of ganglionic force. This regular round of harmonised nutritive movements—the "periodic time" of nutrition, if I may so term it—varies in different persons. In hardly

two is it alike. One man, with a slow but good digestion, makes a good breakfast, and, after an interval of nine or ten hours, makes another large meal, no great craving for food being experienced in the interval; another requires food (it may be in small quantities) every two or three hours, and, failing to obtain it, is incapable of work, and suffers from indigestion. This means that rates of mechanical and chemical digestion vary as the individual; that each has his periodic time of digestive revolution, to vary from which is discomfort or disease. Excess of supply is usually accompanied by excess of waste, and large eaters are generally slow evacuators (but not always), *i.e.*, the stomach does not always extrude its contents with a rapidity proportional to the mass it receives. On the other hand, some stomachs, whilst they can receive only a small quantity at a time, rapidly pass it forward, and hence results the feeling of emptiness that requires the supply of food at short intervals. These facts explain many of the phenomena of indigestion in the sane, and to a greater degree in the insane. Take the case of a man in whom, from circumstances, the times of taking meals are baulked. The regular course of the nervous element of digestion not being satisfied, its periodic times being upset, there results a discord in the digestive organs, matters ingested are not assimilated, and a state of temporary blood-poisoning, indigestion, results; or the proper quality of food not being at hand, some of another kind—perhaps fluid—is taken, with results the same. A large amount of insanity is caused by this irregular ingestion of food, leading, as it does, to an impaired nutrition.

Have we any proofs of the existence of these periodic times in the different parts of the alimentary canal? In disease the times are altered. The intense craving for food in general paralytics is due to the rapidity with which the stomach forces the food onwards. Were it not indeed for this, it would be impossible for these people to take the enormous quantities of food they do, from mere mechanical reasons. But the food is not digested; hence the diarrhœa from which this class suffer so. It is very much the same with large consumers of alcoholic drinks; the quantities ingested are rapidly sent on, and being incapable of assimilation, set up the diarrhœa, or "loose bowels," from which these persons are never free. There are many who suffer from a feeling of faintness after breakfast, because the stomach, acting too briskly, rapidly extrudes the (usually) small quantity of food taken at the early meal. In such it is better to advise a postponement or delay in the morning evacuation, because the contraction of the large intestine reacts on the stomach and sets it

again in action ; witness the feeling of hunger that often results from a large dejection.

Nothing is more troublesome in the insane than the management of the digestive system, especially in epileptics and paralytics, the former suffering from constipation, and the latter from diarrhœa. As to epileptics, the conditions under which they exist have doubtless much to do with their constipation ; but there is besides something in the nervous condition. Thus an epileptic will have a fit, and be disqualified from taking solid food for a day or two, but the results are not what would have occurred from a simple fast : they are the result of a nerve affection of the intestinal canal, shown by alterations in the mucous membrane. What spoils a person's appetite so readily as bad news or nervous excitement ? and what better remedy is there in a house of mourning than a purgative medicine ? In melancholia the refusal of food is often owing to nervous derangement of the stomach, and as the mental symptoms improve, so does the digestion. Hence it cannot be scientific treatment indiscriminately to force food on an organ whose functions are paralysed or altered by the loss of its proper nerve tone ; rather should we wait a little and restore the mucous membrane through improved nerve power. Jaded minds set up impaired nutrition, and the true secret of healthy digestion is the management of the nervous system ; for though diseased mental states are often due to a disordered alimentary system, the converse is probably often as true. If the insanity is of a permanent type, a permanent alteration in the nerve cycle, or disease in the alimentary canal, as shown by definite post-mortem appearances, results. The lesions to which I would call attention are situated chiefly in the colon and in the jejunum ; they are patches of ulceration, sometimes so extensive as to resemble a honeycomb network. The edges are usually slightly raised, and perhaps reddened, but the ulcers are at other times more like punchings-out of the mucous membrane, and there is often a little yellowish loose gelatinous material. The ulcers in no way resemble those of enteric fever, nor are they found in the same situation ; indeed, I have never seen them in the lower part of the ileum. The descending part of the colon is the most subject to them, and next to it is the jejunum. Even where the stage of ulceration has not been reached, there are patches of redness and sub-mucous ecchymoses, indicating an earlier stage of the degeneration. It is in these cases that the diarrhœa so often met with in the last stages of mental paralytic disorders occurs, a diarrhœa defying all remedies, and attended with great fœtor. To what is this ulceration owing ? Certainly not

to the action of purgatives, for it is rarely seen in epileptics, who take more purgatives than any other class of patients in an asylum. It is true that I have seen ulcers in the large intestine of epileptics, but these are mostly found underlying a hard fœcal accumulation, and I have always looked upon them as due to the constant pressure of the lump on the mucous membrane, *i.e.*, to a mere mechanical irritation. The ulceration met with in advanced cases of brain disease of the paralytic form I take to be part of the general disintegration that occurs in all the tissues in these diseases. The chain of sympathetic ganglia supplying the intestines is probably at fault in these phenomena; the food that is taken, frequently in very large quantities, never undergoing proper digestion, the formation of chyle is much interfered with.

Much of this intestinal irregularity is, no doubt, owing to imperfect action of the liver and pancreas, but beyond this we must, I think, view the irritative condition as a disarrangement owing to impaired (whether paralytic or irritative) nerve function, causing both an alteration in the actual digestive structure, and an upsetting of the sequence in which the muscular coats of the bowel act. It may be objected that the muscular movements of the intestines are all secondary to the stimulus of the contents, and that, therefore, a difference in the usual time-rate or periodic nervous cycle is dependent on the imperfect digestion of the food. But I contend that, given a regulated diet, and one that is found to agree with an individual under fixed conditions, it will be found, if that person becomes insane, that the harmonic or periodic times of muscular contraction are altered; that, owing to abnormal muscular contraction, food is not allowed to rest a sufficient length of time in that particular part where certain of its constituents should be assimilated, or put into a state for assimilation; that diarrhœa results, and that on post-mortem examination ulcerations are found.

How can this muscular irritation and irregularity be proved? Mainly by comparing what we see with what we should—given certain circumstances—expect to happen; for the subject is scarcely capable of direct experimental proof. A diminution, then, of the time of stomach digestion would, independently of the natural extension of movement to the intestines, set up in them an irritative movement. This is what we should expect, and we see that it does so happen when food which has undergone a limited amount of stomach digestion is passed per rectum almost unchanged, *i.e.*, when the sequence of juices has not had time to occur, and the food, slipping by unacted upon, is

brought into contact with parts that have no power over it, and is finally excreted as an "indigesta moles." Again, supposing stomach digestion to have gone on properly, but the action of the duodenum and jejunum to be too irritable to allow of the proper "time" for what is passed into them, we find, as we should expect, diarrhœa due to similar causes, as in the above instance.

I am quite aware that for a thoroughly scientific corroboration of these views chemical analysis of the excreta is requisite, to show that digestion has been imperfectly performed in one or other portion of the intestinal canal; but failing this corroboration, my object is to call attention to certain clinical and post-mortem appearances, and to try and connect with them the irregularities that occur during life from incoördinate muscular action determined by defective or altered nerve force. One practical result is, that even in constipation it is at times of doubful use to give a purgative, because in those cases I have mentioned, where an ulcer is met with underlying a hardened fœcal accumulation, the result of the evacuation is that a diarrhœa ensues; and though I have never seen this go on to a rupture, I can easily imagine that it might do so. Another practical result is that in the diarrhœa of persons in the last stages of cerebral disease it is quite useless to give astringents, for one patch of ulceration seems to succeed upon another, and the best treatment is found in regulating the diet. If, however, we recognise the condition above stated of alteration in the "periodic times" of digestion, we may be able to apply them to the feeding of patients on a rational system.

Thus in large buildings, where meals are served at routine times, some persons may be noted who, though they cannot take the quantity issued to them, are yet unable to pass without discomfort the interval between one meal and the next. Here feeding at short intervals is necessary for their nutrition. In others, it seems as if the morning evacuation directly after breakfast reacted on the stomach, causing it to expel its contents before the first stage of digestion has proceeded far enough. In such cases it is advisable to recommend that the evacuation be delayed an hour or two, to give time for the stomach to proceed quietly with its functions.

The following are taken from the post-mortem records, and the history of the cases bears out more or less completely the remarks made above:—

J. B., male. Mucous membrane throughout large intestine much eroded.

C. S., female. Mucous membrane of large intestine eroded in patches.

E. M., female. Large intestine congested and eroded on its mucous surface in the entire extent. This patient had most intractable diarrhœa.

W. R., male—a general paralytic. Jejunum much congested; descending colon a mass of ulceration.

M. H., female—demented. Jejunum inflamed and almost denuded of mucous membrane through continuity of ulceration. Several large ulcers in large intestine.

A. C., female—paralytic dementia. Descending colon denuded of mucous membrane in many places, in others the seat of small ulcers in various stages.

M. F., female. At lower part of jejunum and upper part of ileum were, for a very considerable extent, ulcers varying in size from a pin's head to a marble. These had raised and reddened edges, with a yellowish sloughy matter on the base. The same appearances were found in the large intestines, some of them apparently contracting, as if a curative process were being attempted.

A. C., female—demented, much emaciated. Lower part of large intestine much eroded.

L. V., female—paralytic dementia. Mucous membrane of colon almost entirely destroyed by ulceration.

Many other cases might be quoted. Loss of power over the sphincter is a constant sign of nervous disorder. It would be very singular if the disorder causing this loss of muscular power were confined to the voluntary muscle; doubtless it extends to the structure of the intestine, and especially to that part found most frequently to be diseased, viz., the lower end of the large intestine. In "general paralytics," during the last stages, the anterior abdominal muscles are often found in a state of contraction lasting for days. Now, as these muscles are in their action opposed to the sphincter, there must be a constant strain placed on the latter, tending to cause irregularity in its action—an irregularity which would most show itself in upsetting the appointed or periodic times of the muscular movements of the canal. The ulcers so often found in the stomach in persons whose nutrition and nervous force are interfered with doubtless belong to the same category as the above-mentioned cases. If viewed in this light, the chain of degeneration of the nervous tissue of the whole of the intestinal canal in nervous diseases is connected by the same morbid process.

A

# CASE OF SYMMETRICAL GANGRENE,

WITH

## SOME REMARKS ON THE DISEASE.

BY

REGINALD SOUTHEY, M.D.

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Mary Ann W., 40, a married woman, was admitted under my care in Faith Ward, bed 9, on 29th July, for a very remarkable purple-looking patch or ecchymosis, which had suddenly made its appearance over the tibiæ of both her legs.

This we shall describe more minutely presently, but the close homology of the two patches, their entire symmetry in aspect, and extent upon the analogous parts of both limbs, was too remarkable not to attract immediate attention.

She was an anxious-looking woman, who had been badly off, and appeared some ten years older than she really was. For fifteen months past, the glands of her neck, especially on the right side, had been swollen and suppurating, and although on her admission no longer discharging, were only quite recently healed, and still in one place only just scabbed over. There were older cicatrices, and, to judge from appearances, the cervical glands had probably been strumous from her childhood.

*Previous health or antecedent history.*—She was never strong; as a servant, she seldom kept in a situation for more than a few months without requiring a holiday. As a married woman, she has had a variety of ailments, and had been laid up with sore throat, headache, rheumatoid pains, and general debility; her catamenia have always been regular, but although she thought she once had a miscarriage, she has never had a child.

Eighteen years ago she was laid up with rheumatic fever, said to have been followed by typhoid; nine years ago she had smallpox; four years ago her right eye was inflamed, and her

eyesight has suffered ever since. She was treated as an out-patient at Guy's Hospital, where iridectomy was performed on her right eye; the left eye became affected afterwards, and was relieved by treatment without operation. Two years ago, September 1878, she had general dropsy, which began in her feet and extended up her legs, her face being swollen and her eyelids puffy. She was in bed then for six weeks under medical treatment. Ever since this period her legs have swollen a little after she stood long upon them, and have been hot and inflamed at times, with a blush like erysipelas extending from her ankles half-way up her tibiæ. Rest alone sufficed always for the abatement both of the swelling and rash. Twelve months ago last Easter, after she had cleaned a grate, she first noticed numbness and coldness of the fingers of both her hands (they went dead). Warmth and friction led after a little while to the restoration of their natural warmth and sensibility, but they used to tingle and burn on coming back to themselves.

Accidents of this kind, *local syncope*, happened to her more than once; she could not remember how often, but one day she was frightened by observing that her fingers were not only numb and dead, but became black (purple black). Upon the first occasion when this happened, she passed some urine like black blood, and consulted Dr. Mainwaring of Bethnal Green upon the matter, showing him the state of her hands and the urine she had made. He said she had kidney-disease, and ordered her to stay in bed. The first time her fingers went black, the blackness lasted only for about an hour and gradually disappeared; the following day exactly the same thing recurred, the lividity lasting about the same time; and the circumstance repeated itself several times over for a period of about ten days, each occurrence being attended by a pain she describes as almost unbearable.

The blood-coloured urine was passed for several days in succession. She cannot remember if at that time she might have passed any that was natural coloured, but thinks this possible. Intermittent hæmatinuria (?).

Subsequently, about a fortnight later, when her urine was natural, the toes of both her feet became affected in a similar manner to her fingers, and some streaks extended up the veins of her legs. She showed these longitudinal black streaks to her doctor, who remarked that "*it* would take its course." She remained a month in bed.

From July 1879 up to July 1880 she enjoyed comparatively good health, presenting no asphyxia-blotches, or local syncopes. But on 14th July 1880 she was said to have had a fit, which lasted an hour, and in which she lost consciousness. Her hus-

band was much alarmed and sent for a medical man, who advised that she should be removed to the Hospital.

On 24th July both her legs suddenly became a livid blue colour in the part between her knees and ankles. Their aspect and the pain she felt was exactly similar to that which attended the purpuric-like blotches on her fingers and toes a year ago. First an aching then an itching sensation occurred, and, just as in their instance, the discolouration faded away, the limbs becoming free from pain after a certain interval of time, and resuming their normal aspect.

On 25th July, while she was being brought to the Hospital in a cab, she was seized afresh with pains in her legs. She distinctly affirms that her legs were quite normal in their appearance before she left her house. During her journey the pain she suffered in them was more extreme than any she had ever felt before; and upon her arrival at the Hospital it is certain that the skin of both shins and calves was blue-black, as if it had been badly bruised (but there was no swelling, and the skin was not broken).

*Condition on admission.*—A sallow cachectic woman, whose incisors were notched and her teeth generally much decayed; both cheeks flushed; breath foul; tongue moist and slightly furred; appetite bad. She complained of being feverish and thirsty, but her temp. was only 98.8°, resp. 26, and pulse 146, feeble and running; her bowels had not acted for two days; her urine was scanty, high-coloured, acid, and contained a trace of albumen, but no sugar.

Besides the swollen cervical glands already spoken of, there was some enlargement both of her axillary and inguinal glands.

*Physical examination* of the chest revealed no abnormality. The area of precordial dulness was natural, and the apex beat feeble in normal situation. Hepatic and splenic areas not transgressed; some tenderness in epigastric region, with slight sensation of induration, fulness, and increased pulsation in abdominal vessels.

*Condition of legs.*—From about three inches below the knee-joint to two inches above each ankle and encircling each leg was a purple discolouration of the skin exactly similar to what is produced by a bruise or extravasation; the ankles and feet were pale and perhaps a trifle anasarcous; they were cool but not cold, and feeble pulsation could be perceived in both anterior and posterior tibial arteries. Neither the upper nor lower margins of the discolouration were exactly circular or stocking-like; irregular processes of discolouration extended into natural coloured skin both above and below, yet the main substance of

the blotch was like a port-wine mark, uniform throughout. The skin might have been a little raised, swollen superficially, a line or two; its surface was a little glazed; its ground colour was a dark purple, but graduated off at its edges into the rainbow colours of a bluish green, with a little yellow marbled through it.

While very painful, these patches of local asphyxia (*i.e.*, of blood-stasis in the capillaries) were not very tender to touch. No fluctuation could be felt, while the temperature to feel was manifestly below normal. After enduring twenty-four hours, the surface of the discolouration presented several bullæ, and resembled gangrene more distinctly than at the hour of her admission, and both ankles were more œdematous. There were no other purpura spots about her body; there had been recently no bleeding from any mucous tract, and her gums were not the least scorbutic looking; yet here, as I described them, were symmetrical patches of blood-stasis and arrested nutritive interchanges, which, if not remedied shortly, must terminate in necrosis of an extensive portion of skin.

I headed the board—for the disease was new to me then—"Dermatitis contusiformis;" and when, a day or two later, other little doubtful indications, as the formation of bullæ, wrinkling, maceration, and detachment of the epidermis, pointed to skin mortification, added "Gangrenosa symmetrica."

*Treatment, course, and progress.*—The affected parts were powdered, wrapped in cotton-wool, carefully supported by pillows beneath the thighs and heels, protected by a cradle, and kept warm within this by hot-water cans.

The woman was collapsed and cold after the fatigue of removal to the Hospital, but her pulse rallied after some stimulants were given her; and although for the next few days her appetite was poor and thirst moderate, she took a fair amount of nourishment—milk-pudding, fish, and four ounces of sherry. As her bowels were confined, I ordered some tartrate of soda and sulphate of magnesia to be given every six hours until the bowels should have acted twice freely.

For the first two nights she suffered very constant and severe aching and burning pain; she had but little sleep. After her bowels had acted she was easier, but I ordered five minims of laudanum and a drachm of tincture of bark to be given her every four hours, to render her sufferings less irksome. Her feet, she said, were numb, but not cold; the toes were of natural colour.

August 1.—Highest temperature of twenty-four hours, 99.2°; has passed a fair night, not sleeping, but taking nourishment, with tongue still much furred.

August 2.—Eight ounces of blood-stained serum was withdrawn by a prick from the large bulla which had formed upon the left leg, and four ounces from one of smaller size upon the right. The legs were still kept powdered, and wrapped in cotton-wool and tenax; her pulse was 120, resp. 24, temp. 99.2.° The bowels remaining costive for four days, and her discomfort increasing, I was forced to stop the sedative draught and give her occasional purgatives.

On the 8th August her pulse had fallen to 108, and she felt and expressed herself as feeling much easier.

August 8.—Early this morning the index and middle fingers of both hands suddenly became painful, and assumed a dark livid colour, similar to her habit already described; the discolouration gradually faded away after lasting an hour or two. The discolouration extended, according to a description given me, about a third up the backs of all the fingers; but while the rest of the fingers were livid, the index and middle were purplish.

A serosanious fluid collected in the large bullæ about the legs again, and was evacuated by pricking them; the quantity which thus escaped amounted to some ounces, and was so offensive as to necessitate the application of charcoal-poultices round the limbs, which were renewed three or four times a day.

On the 10th her wine was increased to eight ounces, but the old scars on the right side of her neck softened and the tissues began to bleed. The gangrenous integument now began to separate from the aponeurosis over the muscles, and left a raw honeycombed granulating surface. By the 13th very little offensive smell was noticed, and the legs were henceforward dressed with lead and opium lotion.

From this date the sore entered upon a stage of granulation and suppuration, healing at its edges, and extending from time to time again over parts which had healed, in a manner which was very disappointing, but exceedingly characteristic.

The whole surface of the ulceration was at one time fungous looking, with abundant vegetative cauliflower-like granulations, which bled upon the surface very readily, and much resembled epithelioma; at another, a day or two later, it would be nearly caked over with drying secretions like an eczematous surface; but when a stimulant lotion was applied to them, the granulations would sink down and melt away, presenting an irregularly eroded ulcerated surface.

On August 24, at the suggestion of my colleague, Mr. Baker, some quinine and iodide of potassium were administered to her, with apparently the good effect of expediting the healing process and improving her digestive powers.

Domestic troubles forced her to leave the Hospital long before the ulcers were healed, but her general health was much improved; tongue clean; appetite fair; pulse 98; temperature normal. Still, on her discharge, her legs were far from being healed. In September, after the death of her husband, whom she had left the Hospital to nurse, she returned to the ward, which she is still in, the ulcerated legs presenting a remarkably emaciated aspect, and exhibiting singularly little inclination to heal, although I have tried various stimulant and emollient applications to them. But she eats and sleeps well, suffers very trifling pain, except when her wounds are dressed and looks remarkably well in the face.[1]

To Raynand we owe nearly all our knowledge of this remarkable form of disease, which may and does lead, as illustrated by this case, to a very remarkable and distinguishable form of gangrene—a gangrene which appears to have no tendency to provoke septicæmia, and which, in no case that I have read, has terminated fatally. But it is not to the gangrene only that I desire to point attention. I wish to append some brief sketch of the disease to this case, and have collected some others which prove its existence as a special piece of pathology well worth study; for, like every disease well studied, it serves to render other maladies more intelligible.

Raynaud first called attention to it as a very remarkable neurosis, and showed its alliance with the well-recognised every-day complaint of numb or dead fingers. Indeed, to this trivial occurrence it may be regarded as the pathological possible sequel. Young women and emotional persons are sometimes subject to their fingers going dead. Exposure to cold, taking a cold bath before breakfast, staying too long in the sea, anything which shocks or depresses the circulation, determines this event in certain individuals. Now, if this stasis of the circulation is much prolonged, or if, from some further abnormality in the blood itself, the capillary nutritional interchanges are rendered infeasible, the part thus starved of blood does not reanimate, but dies.

Next, Raynaud showed that there was a further grade or modification of dead fingers or local syncope, in which the appearances were more serious, and the proclivity to actual mortification nearer; this he called local asphyxia, as distinguished from local syncope. In local asphyxia complete contraction of the arterioles does not blanch the vascular area; the part, a finger-tip perhaps, instead of paling, becomes livid, slate-coloured, purplish, or black; the blood does not pass on; the veins do not empty; the circulation comes to a stop with blood

[1] Nov. 15. The ulcers of the legs are just healed.

within the capillaries Probably no oxidation changes take place, or only very imperfect nutritional chemical interchanges, and therefore the blood will not pass through the capillaries.

While the part thus affected feels numb, is cold, and has lost tactile sense and local sensibility—for it is anæsthetic, and may be pricked with impunity (it does not bleed)—there is a sharp burning pain referred to it, sometimes of an extreme intensity, only to be relieved momentarily by plunging the fingers into cold water.

It appears, too, according to Raynaud, that the degree of pain suffered bears some relation to the depth of colour of the affected skin area, being most severe when this is fullest of black blood.

These patches of local asphyxia, followed by gradual reabsorption may recur, just like the local syncopes, again and again. They are, it is true, more painful and more alarming, but here the thing may stop ; whereas in some cases, after this anomaly has been occurring for a month or more, gangrene may ensue.

*Local asphyxia.*—Ordinarily the colour changes and discomfort are what alone attract the patient's attention; they have been closely observed and described during the asphyxia. The epidermis layer looks abnormally transparent by reason of its livid or purple, in lieu of natural pink-coral background. After an hour or two hours' duration, if the restoration of the circulation is going to take place, the reanimation of the part is usually signified by colour changes. Thus the uniform purple hue becomes bronze coloured in patches, and these gradually fade into brighter red, which again finally fade or are merged into the normal skin colour, although quite at the finger cushion-tips these usually persist as dusky red patches, that only more gradually subside.

The general symptoms beyond the pain are either nil or only very trivial; sometimes none are noticed ; at others, palpitation of the heart, with frictional blowing murmurs.

The third stage of this singular neurosis, the passage of this local asphyxia into local mortification, is what we have had an example of in the case I have recorded, and as to which I think I need add here very little further description. The local pains are increased in intensity ; the skin mortifies ; livid marblings stretch up the course of the veins, returning from the livid areas or patches. The veins, like their walls, appear swollen ; bullæ form and run together ; they contain serosanious fluid, having a fœtid, decomposing odour. The cuticle wrinkles and separates, and the dead skin sloughs away, exfoliates in shreds, and leaves an eroded granulating surface and honeycomb-like ulcers, which penetrate to different depths into the subjacent

layers of muscles, and may extend down to the periosteum of the bone itself, and even lead to its necrosis; but they always do heal, although they cicatrise very slowly. When finally, or after three, four, or ten months, the ulcers heal, white depressed scars, some superficial, others deeper, mark the site of the gangrene; and for very long afterwards the new skin tissue is of a shagreen toughness, and a brown, leather-like, wrinkled, or mummified aspect.

## Remarks and Parallel Cases.

Sir James Paget reported a case, evidently of local asphyxia, brought on apparently by cold baths, in vol. vii. of our Reports, p. 67.

There is one feature of the complaint to which my own case points, and some others do—the tendency of these local asphyxias and local gangrenes to be symmetrical upon the two sides of the body. Thus similar parts may be affected in both upper or lower extremities, or both ears; or the median parts, as the nose or the skin over the coccyx have been affected.

Raynaud describes a case in which the point of the coccyx was the seat of the gangrene, and notices another, in the person of a girl of sixteen, in whom both feet were affected, ulcers the size of a twenty-centime piece having formed just above each external malleolus.

The nail of a toe or finger may be, as it were, partially gouged out of its matrix by the gangrene, its extremity being left living and untouched. The nails do not grow so long as the mortification lasts.

Raynaud defines the disease as a neurosis characterised by an exaggeration of the excito-motor power of the cord in presiding over the vaso-motor nerves.

*Literature*—The "Archives Générales de Medicine," 1874, p. 5, contains the article by Raynaud in which he describes symmetrical gangrene as a neurosis in which the normal excito-motor function of the spinal cord by which it presides over the vaso-motor nerves is exaggerated. This theory led him to advise constant descending currents down the spine in treatment.

But quite the best description of this doubtless rare disease is to be found in the "Nouveau Dictionnaire de Médecine," under the word "Gangrène," and sub-heading "Gangrène Symétrique," which reads as if Raynaud himself had written it.

Vulpian has described symmetrical congestion of the extremities, observed in certain cases of neuralgia ("Leçons sur l'Appareil Vaso-Moteur," Paris, 1875).

Bilroth describes a case in the "Wiener Med. Wochenschrift," No. 23, p. 1878. The parts affected were the finger-tips. The discolourations were followed by gangrene and necroses of phalanges resembling "paronychia," and terminated in the exfoliation of small, dry, parchment-like crusts. The disease continued over two years.

Dr. Charles K. Mills, in the "American Journal of the Medical Sciences," October 1878, reports a case of vaso-motor and trophic affection of the fingers, which might well be regarded as an example of Raynaud's recurrent form of local asphyxia. Here, too, the fingers were the parts affected. The disease lasted over a period of four years. In the same patient, once after dancing the tip of her tongue was affected, became bluish-white, and tingled or felt as if it had been scalded. Her troubles were exaggerated by emotional disturbance.

Dr. J. Collins Warren's case is an illustration, "Boston Medical and Surgical Journal," January 16, 1879, vol. c.–ci., p. 77.

A weaveress, Scotch by birth, unmarried, 25; feeble and of spare habit; enjoyed good health up to four months of present illness, and never had syphilis.

Had a slight cough and lost flesh. Dulness and rales at left apex. Heart sounds normal.

Four months ago her nose bled frequently for over a period of two weeks; then the tips of her fingers and toes were noticed to be red.

When admitted, June 27, 1878, the ends of her fingers and toes were very remarkable. The pulps or bulb ends were of a purple colour. The patches stretched round to back of finger-tip, running round under the edge of the nails.

The hue was deepest and the condition most characteristic of gangrene in the centre of the patches on the palmar aspect. These centres separated as black eschars, the largest not larger than a five-cent piece, and left a healthy granulating surface. Treated with iron internally, good food, and resin cerate, the toes had recovered their normal appearance in a few days, and all but two fingers had already sloughed. These two finally went like the rest.

On August 16 the granulating surfaces had all healed, and the fingers presented a red, shrivelled look. There was no gangrene of the toes, and her general condition was good on her discharge.

Englisch in the "Wien. Med. Presse," xix. 35–41, 1878, narrates two cases:—

1. A servant-maid, N. P., aged 42. Admitted January 11, 1877; discharged March 30, 1878. Her illness began in 1875.

Her toes used to go dead-white, with slight stinging pains; later on bullæ formed containing yellow serum, and when these broke and the skin came away, ulcers formed, which in some instances penetrated down to the bone.

She was admitted with the ulceration in various stages; redness and raw ulceration of the skin of both upper and lower extremities, with some superficial scarring or scarred sores; others burrowing and sinking between crusts or walls of excessive epidermis growths (proud flesh, exuberant granulations). The third phalanx of the third toe on the left, and fourth toe on right foot exfoliated; then the third phalanx of the second toe of the left foot with considerable contraction and deformity.

The case nearly healed and relapsed several times, but was finally discharged well. Her general health had not at all suffered; and although at times she had experienced considerable loss both of sensation and power of motion in her toes, both were fairly restored on her discharge.

Among the instructive features of her case were her history, which is well detailed, and her treatment. In early youth she had intermittent fever and was chlorotic, with irregular menstruation (of syphilis there had never been one clinical symptom), but she had worked hard. In January 1866 she was suddenly frightened and fell insensible, lost her speech for a time, and suffered afterwards with singing in her ears. Twice in January 1871 she had noises in her ears, associated with bleeding from them. In 1867 she had erythema fugax of her left thigh; in 1868, little bullæ with sanious contents formed on her toes, attended by racking pains in her bones, and erysipelatous-like inflammation of her right thigh.

*Treatment.*—Electrical, constant and faradic, current and electric baths; nux vomica.

Shortly before her attacks her countenance became livid almost cyanotic in appearance. Excessive epidermis granulations preceded healing, which spread both peripherally and deeply; the bone itself swelled, was thickened, and felt soft, and finally suffered atrophy.

2. M. W., aged 17, was admitted May 24, 1878. She had been taken ill two months before with pains, swelling, and redness of the middle finger of her left hand; next the palm of her hand was affected, and finally the middle finger of the right hand. Afterwards bullæ formed and affected the finger-tips, and filled with sero-purulent contents. They healed without much change, but left depressed scars. The sensibility of the finger-tips to the faradic current was much lessened, as also the irritability of the thumb muscles, the interossei, and the extensors

of the fore-arm. The power of appreciating temperature changes —heat and cold—was diminished in both right and left middle fingers. Normal irritability to galvanic stimulation existed in the median, ulnar, and radial nerves. With exception of frequent headaches, the patient was well in her general health, and menstruated regularly.

Englisch propounds some theories on the pathology of this disease. As complaints like it (but still very distinct), he regards ergotismus, frost-bite, diabetic gangrene, nephritis interstitialis, the cyanosis of heart-disease, syphilis, and lepra.

As nearer akin, we perceive the skin affections that succeed stretching and destruction of nerve trunks, the bullæ of pemphigus, the vesicles and sores of herpes, the alterations following neuralgia. As predisposing causes, place those which disturb the vaso-motor system—brain injuries, mental shocks, frights, concussions, succeeded, as these sometimes are, by chlorosis and menstrual anomalies.

Raynaud attributes the local mischief to cramp-like contraction of the arterio capillaries. He thought quinine, strychnine, and electricity appropriate remedies. He reads the disease as an illustration of spinal vaso-motor reflex, of which he perceives three grades or degrees:—

1. Slight reflex spasm of arterioles—local syncope.
2. Profound arrest of circulation by reflex spasm—local asphyxia.
3. Mortification by prolonged arrest of circulation, by spinal excitor-motor spasm.

The symmetrical nature of the lesions is due, according to him, to the common central spinal vaso-motor regulator centre.

Further, clinically, we perceive three stages of symmetrical gangrene:—

1. Of invasion—local asphyxia, with imminent gangrene (lasting a month about).
2. Of gangrene—access and duration; whole mortification (limited and completed within ten days usually).
3. Of healing by suppuration and granulations, in a period varying from twenty days to ten months. Resolution ordinarily is effected in three or four months, but crusts of epidermis may continue to form and detach for more than a year.

Further, there appears an acute or shorter, and a more chronic or remittent form of the affection, which may present three to five relapses of three or four months' duration, and be extended then over a period of two or three years, to be succeeded finally by yellow scleroderma.

It is darkly hinted by some writers that some of their cases

have died from protracted discharges and asthenia. I cannot find any case detailed which has been thus watched to the bitter end.

*Etiology*—M. Raynaud, in his admirable description, justly calls the disease juvenile, as distinguished from senile gangrene. Cases above forty are exceptional; the feminine sex are preferentially affected between eighteen and thirty. At twenty-five nervo-lymphatic individuals are the favourite subjects. The seasons of November and December are most favourable to the disease. One case was observed in a diabetic subject, a woman aged 31. The order of events was as follows in her:—1st, for eight years she exhibited a tendency to local asphyxia; then, 2d, symmetrical gangrene of both extremities took place; and, 3d, intense diabetes, 76 grammes of sugar per litre per diem being passed by her; 4th, pulmonary consumption ensued. Treatment by Vichy water led to complete disappearance of the sugar and restoration of health.

# DISEASES OF THE NERVOUS SYSTEM.

BY

SAMUEL GEE, M.D.

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The following diseases are illustrated in the present paper :—
Spastic paraplegia in infancy and adult age.
Spastic diplegia.
Sclerosis of encephalon in inherited syphilis.
Paralysis due to compression of the arm.
Traumatic myelitis, followed by muscular atrophy and spastic rigidity.
Motor ataxia of legs, with paralysis of orbicularis oris.
Teichopsia.
Infantile spinal paralysis.

## Spastic Paraplegia in Infants.—Part II.

In the Hospital Reports for 1877 I published notes of four cases of spastic paraplegia. The present paper contains the histories of four cases more, and also carries on the record of the first case, narrated in the former paper.

The essential character of the disease is rigidity of the legs, or of the legs and arms, which increases when the limbs are handled, and disappears under the influence of chloroform.

The lesion is congenital, or at least begins in early infancy.

The affected muscles act well to faradism.

The nutrition of the muscles is kept up; there is no amyotrophy. (In the first case, the muscles of one leg did waste after the disease had lasted eleven years: these wasted muscles were not wholly relaxed by chloroform.)

Patellar reflex well marked.

Choreiform movements of face in two cases; incoördinated movements of arms in one case.

Back weak in all cases.

Tendency to convulsions in two cases.

Painful cramps in legs in one case.
No lesion of micturition.
No affection of mind or senses.
General nutrition of body good.

In the former article on spastic paraplegia, I said nothing about its pathology; and even now, after six years' experience of the disease, I have nothing to say. Chance has not yet yielded that clew which a post-mortem examination would afford. In this state of uncertainty, therefore, the matter must at present be left.

### Case I.—(*continued.*)[1]

John B., admitted into St. Bartholomew's Hospital in November 1879. Notes by Mr. O. Browne.

11. Rigidities:

(1.) Left leg: thigh strongly turned inwards, so that the leg lies on the inner side of the calf. Toes, for the most part, extended and separated, sometimes flexed. It is hard to straighten the leg, any such attempt being at once opposed by strong contraction of the hamstrings. When handled, the leg is slightly lifted, the ankle being bent and the foot turned outwards.

(2.) Right leg: when handled is lifted to an angle of from 45° to 90°, and at the same time carried strongly across the other leg. No pain on forcible flexion of knee. Foot in strong equinus position, and turned slightly inwards. Big toe mostly extended.

(3.) Left hand: opens and shuts well. No stiffness or divergence of fingers.

(4.) Right hand: grasps much more weakly than left. When hand is opened fingers diverge. Frequent slow movements (like athetosis) of all the fingers, chiefly flexion of the second phalanges on the first, the hand being at the same time abducted.

13. Muscular atrophy: muscles of right calf wasted and flabby; muscles of right thigh also somewhat wasted.

16. No trembling of calf muscles after strong flexion of the ankle-joint. No trembling of hands or feet after bending and straightening joints.

18. Effect of chloroform: administered on November 14, caused the rigidity wholly to disappear, except in the right calf, which still showed some tightness of the tendo Achillis. The adduction and internal rotation of the left thigh disappeared.

19. Effect of physostigma: on November 11 he began to take extract of Calabar bean. The dose was at first ¼ gr. twice

[1] St. Bartholomew's Hospital Reports, vol. xiii. p. 71.

daily, and was gradually increased to 1¼ gr. three times a day. On December 9, the boy looked pale and the drug was left off. No effect of any kind.

20. Faradism: muscles of legs, arms, and face act well to slight faradic currents, but not excessively.

21. Patellar tendon reflex unusually well marked on both sides; disappears when boy is under the influence of chloroform.

## Case V.

Louisa W., aged 4 years when admitted into the Hospital for Sick Children on January 4, 1878. The notes by Dr. Garlick.

Always seemed a healthy child, except with regard to her legs. She had learnt to talk well by two years of age. No convulsions.

Always able to move legs in bed, but has never been able to walk. At three years of age, could stand holding on to things. At two years of age, mother tried to make her stand, and then noticed that the child crossed her legs and rested on her toes; could not bring her heels down. Sat up first when fifteen months old; leaned forwards. Converging squint of right eye from infancy.

Her symptoms while in the Hospital were the following:—

1. General condition good; no fever.

2. Intelligence natural; speaks plainly; clean; feeds herself.

3. Converging squint of right eye; no palsy of face or arms; swallows well.

4. Sits in a heap; back much bent. Can pull herself up into the sitting posture, but often leans to one side (mostly the left), using her arm to support herself.

5. Legs not so well nourished as arms. Performs movements at all the joints; but these movements are much hampered by a tendency in the legs to cross, and to become stiffly extended. When the legs are handled, after a short time rigidity comes on; all the joints are extended. When put on her feet, the toes only touch the ground; the legs become rigidly extended and crossed.

6. Chloroform removes the rigidity.

7. Muscles act well to faradism.

## Case VI.

Alice P., aged 2¼ years when admitted into the Hospital for Sick Children on April 24, 1878. The notes by Dr. Garlick.

Nine other children in the family; all healthy, and able to walk well.

Has never been able to raise herself from the lying posture or to sit up for any length of time. Has never walked; can move her legs in bed. When put on her legs, they cross and become stiff.

She talked early, and is as sharp as any of the children. Clean in her habits.

Her condition whilst in the Hospital was the following:—

1. A bright, healthy-looking child; no fever.

2. Cannot get up very quickly from lying posture.

3. Legs flabby; can be moved voluntarily when lying. Put on her feet, all joints become rigidly extended; legs cross. This condition ceases after a time, and then the child, being held up, puts one leg before the other. Handling the legs, in the lying posture, does not bring on rigidity. Arms natural.

4. Subcutaneous injections of $\frac{1}{120}$ gr. of strychnia produced no perceptible effect.

## Case VII.

Maria M., aged $4\frac{3}{4}$ years on admission into the Hospital for Sick Children on October 16, 1878. The notes by Dr. Garlick.

Nothing noteworthy in the accounts given of her kindred.

She walked when she was a year and three-quarters old, not well indeed, but still she managed to get about until she was three years old; then she began to fall, and the right leg used to become stiffly extended.

Her symptoms while in the Hospital were the following:—

1. Nutrition good; no fever throughout.

2. Seems dull and heavy, but talks plainly.

3. No choreiform movements while sitting in bed. When she tries to feed herself there are decidedly incoördinate movements of the hands.

4. Put on her feet, she cannot stand for any length of time without holding; she behaves as if giddy, sways, and would fall. Walks with feet far apart. Decided rigidity of legs below knees; ankles extended; but rigidity not constant, and not produced when child is stood on her feet. Legs sometimes crossed.

5. No incontinence of urine. Converging strabismus; no note of ophthalmoscopic examination; pupils equal and natural in size; child sees well. No facial palsy.

6. Effect of physostigma.

November 2, 11.30 a.m.—One sixteenth of a grain of extract of Calabar bean injected into right thigh. She vomited an hour and a half afterwards in the middle of dinner, and became very drowsy.

November 4, 11 a.m.—Another injection. Three-quarters of an hour afterwards, pale, lying on side, and burying face in pillow; very irritable, not behaving at all in her usual manner; dislikes being moved. Pupils natural in size, or, if anything, rather large. Pulse 100, regular; feet cold.

The injection was repeated every other day until November 14, with the same results. Drowsiness and pallor were constant effects. Pupils noted to be contracted five minutes after the injection; contraction soon passed away. If touched while she is drowsy, she becomes rigid all over until she awakes. She afterwards took the physostigma internally, but without any good result.

This case is not so well characterised as the others; but weighing it whilst in the Hospital, I came to the conclusion that it was a spastic paraplegia.

### Case VIII.

Jessy M., aged 3 years when admitted into the Hospital for Sick Children on October 10, 1879. The notes by Dr. Abercrombie.

She has never been able to walk.

Her symptoms while in the Hospital were the following:—

1. A well-nourished, healthy-looking child; no fever.
2. Slight alternating convergent strabismus; no ophthalmoscopic changes.
3. Cannot sit up well by herself.
4. Nothing amiss with arms.
5. Both legs rigidly extended, drawn closely together. Cannot move them of her own accord. Cannot stand; when tries to do so, the legs are drawn tightly together, and tend somewhat to cross. She manages to get her soles fairly flat on the ground. No ankle clonus. Patellar reflex natural. Chloroform removes rigidity wholly.

### *Spastic Paraplegia in an Adult.*

The following case illustrates the disease which Erb has called by the name of spasmodic spinal paralysis, and Charcot by that of spasmodic tabes dorsalis. With regard to the cases of infan-

tile spastic paraplegia which I have published, I may say that the first of them was observed before Erb or Charcot had published anything on the subject.

Thomas O., 39 years of age, admitted into Luke Ward on April 29, 1880. The notes by Mr. James Harper.

Three or four years before admission he had a venereal sore and bubo, not followed by any secondary symptoms.

He has always been a weak man. Before August 1879 he fainted several times at intervals of some months. But he could always walk well until August 1879, when he had a sudden fainting fit, and remained unconscious for a quarter of an hour. On recovery, he found that he could not use his right leg; on trying to bring it forward, he felt sharp pain shoot from the hip downwards along the front of the thigh. He had to walk backwards, dragging the leg and keeping it stiff, because any movement of it pained him. He went to bed for a week and partly regained the use of his leg; there was less pain in bending it, but he was still awkward in walking. He now observed that his left leg also was similarly affected.

Since that time he has been able to move about somewhat; but the pain returns after much walking, the toes drag, and the limbs start sometimes. He does not think he is getting worse.

*State on admission.*—Natural and vital functions are normal. Ophthalmoscopic appearances natural.

He walks very stiffly, with both knees and ankles slightly flexed. The legs are equal in size. The muscles are thin, but firm and not wasted; they act naturally to the faradic current. Patellar tendon reflex is well marked; the muscular contraction is more enduring than in the healthy state; the leg does not return so quickly to its relaxed condition. No ankle clonus. Knee and ankle joints stiffened; hip-joints seem natural. No anæsthesia. No urinary lesion. Arms natural. No cephalic symptoms.

He took small doses of corrosive sublimate for two months. At the end of this time he said that he could go downstairs better than before, and that he had no need to hold by the balustrade. There was no apparent improvement in his walk.

### *Spastic Diplegia—Sclerosis of whole Encephalon.*

In the last volume of the Hospital Reports (vol. xv. p. 63), Dr. Norman Moore published the account of a patient of mine in whom spastic diplegia was associated with sclerosis of the motor regions of the cortex cerebri. I have now to record another case of spastic diplegia, due to sclerosis of the whole brain.

Ellen Eliza B., aged 11½ years when admitted into the Hos-

pital for Sick Children on November 13, 1879. The notes by Dr. Abercrombie.

Her parents were reported healthy. But she was the only living child, and the last out of a family of ten. One child had been stillborn; eight children had died under two years of age. The patient was born at the full time; had not had snuffles, rash, or other sign of syphilis. She was always thought to be rather dull at school. She had often fallen downstairs or in the streets, and sometimes on to her head.

She was brought to the Hospital first in September 1878 for weakness in the left leg and because she was getting stupid. She was attended by Dr. David Lees, who made the following notes:—"Scarlet fever at the age of one year and eleven months; otorrhœa six months later, and recurred at intervals of from six to twelve months until two years ago. Very dull; more so since Christmas 1877, when she fell suddenly, and has fallen six or seven times since suddenly; mostly falls backwards; no convulsive movements when she falls. State on October 7, 1878: pale; vacant manner; speaks indistinctly; left pupil larger than right; slight drawing of mouth to right when face is in action; squeeze with left hand probably feebler than right; seems to spare left leg in walking. On December 31, 1878, two weeks ago, seemed to lose power in her legs and hands; no fit; did not know her mother; left face expressionless; tongue protruded to left; pupils nearly equal; no squint." She used to complain of headache and to put her hand to her head.

Has been confined to bed for five months.

At the latter end of June had a fit which lasted thirty-six hours; the eyes looked towards the left; both hands worked, but especially the left. Has had three fits since, the last fourteen days ago.

Incontinence of urine and fæces for four months.

For six weeks has not known those around her, and has not seemed to understand what is said to her.

Two weeks ago began to take food badly.

*State on admission.*—Very much emaciated. A great bedsore ever each trochanter major, exposing the muscles; a smaller sore over left side of sacrum.

Tongue furred, dry; gums and lips dry. Abdomen much retracted; nothing palpable.

Urine: a faint trace of albumen.

Heart's action regular; no murmur. Pulse very frequent and weak.

Temperature natural.

Otorrhœa scanty, on left side.

Makes no attempt to speak and shows no sign of understanding when spoken to.

No noteworthy changes in fundus of eyes.

No facial palsy.

Can move both arms and both legs, but moves left arm more than right. Arms partly flexed; fingers bent into palms, most on left side; rigidity overcome with a little force. Legs flexed also; much rigidity at knees; both feet in position of equinus, feet being much arched, tendon of Achilles and of tibialis posticus and of extensor communis digitorum being especially tense. Under chloroform the rigidity disappears, except that the right elbow remains extended and the arm rotated inwards, but this position is easily overcome. No opisthotonus.

Great wasting of muscles.

Faradic excitability neither lessened nor increased.

Patellar reflex well marked.

There was little change in her condition before she died. The body-heat now and then reached 100° in the armpit.

She died on December 29.

*Post-mortem examination* twenty-seven hours after death.

Weight of body, 24½ lb. No rigor mortis. Large bedsores.

Head: no thickening of skull-cap.

Dura mater natural; pia mater whitish and opaque in the sulci.

Brain very small, 26¼ oz.; convolutions very well defined and thin all over both hemispheres; they feel very unduly hard also; on section, a sharp line of demarcation between grey and white matter; cortex certainly not broader than natural; the outer half thereof presents a yellowish semi-translucent tinge. Optic thalami, fornix, and septum lucidum feel unduly firm, but present no morbid appearance to the naked eye.

Cranial nerves feel hard, and optic commissure especially so. Vessels at base natural. No excess of cerebro-spinal fluid.

Cerebellum perhaps unduly firm.

Pons and medulla oblongata decidedly small, rather tough.

Spinal cord rather too firm throughout, especially in the lumbar region, where the white matter has a somewhat translucent appearance, Grey matter rather too pink throughout.

Thorax: tolerably firm adhesions over whole of left lung, which is partially collapsed. In upper lobe are some firm yellow cheesy nodules. Weight, 6 oz.

Right lung somewhat emphysematous, 6¼ oz.

Heart natural, 2½ oz.

Gland at bifurcation of trachæa enlarged.

Abdomen: liver small, soft, 14 oz.; spleen 1½ oz.; kidneys natural, 4 oz.

*Microscopic examination of the brain by Dr. Abercrombie.*—Brain examined after hardening in Müller's fluid. Microscopically, the most notable change is the enormous number of leucocytes that are found in the sheaths of the blood-vessels. There is no obvious increase of the neuroglia, but there are a large number of deeply staining bodies in the grey matter, some of which are probably leucocytes. The large multipolar cells have lost their processes, and appear as more or less oval spaces with a central nucleus, surrounded in many instances by granular contents.

Unfortunately the cord was not properly hardened, and could not be examined.

### *Inherited Syphilis—Sclerosis of Encephalon.*

Theresa Anne H., aged $10\frac{3}{4}$ years when admitted into the Hospital for Sick Children on December 3, 1878. The notes by Dr. Abercrombie.

She was born at the full time; had snuffles when four or five weeks old; no eruption.

Could not sit up until she was three years old, and could not walk until she was four.

Had general convulsions, with coma, at three years of age, and again at four, not followed by paralysis.

Five other children in the family; none had fits or snuffles. No miscarriages. Father suffers from stricture.

*Present illness.*—At six years of age she was apparently in perfect health; was walking with her mother, when she suddenly fell down and could not rise. Her mother picked her up, and found that she had lost the use of her right side; she was not unconscious; no convulsion; face not drawn; speech became thick and indistinct (but she never could speak very plainly). She remained in bed three weeks, at the end of which time she was able to walk.

*State on admission, December* 3, 1878.—Very small for her age; ill nourished.

Central incisors notched; change most marked in lower incisors.

Temperature natural; chest and belly natural.

Understanding not very high.

Left pupil slightly bigger than right. No strabismus; no ptosis; no facial palsy. Tongue protruded straight.

Slight paralysis of right arm and leg—very slight indeed of arm; drags leg a little in walking.

Sight good with left eye, but it is doubtful whether she can see at all with right. Mother says child has never been able to see well; does not think sight has got any worse.

Right eye:[1] a greyish white opacity conceals nearly the whole fundus; the opacity is not uniform all over, but there are some folds at the upper and inner part and towards the centre; a few small vessels can be seen on the surface; no trace of disc seen anywhere. Refraction + 3″. Nothing seen by oblique focal illumination.

Left eye: a small black speck on anterior surface of lens. Disk very white. Very considerable diffuse thinning of choroid. Disseminated patches of spider-like pigment, probably in retina. This eye has $\frac{1}{12}$ of hypermetropia. Retino-choroiditis.

From the great difference in the refraction between the two eyes, it is evident that the right retina must be much closer to the observer than the left; must, indeed, be very near the posterior surface of the lens. Retina detached.

Hearing good; no otorrhœa.

*State on August* 5, 1879.—Legs began to swell four days ago; now both feet are swollen and pit on pressure. Puffy about lower eyelids.

Very pale and thin. Glands in neck slightly enlarged. Liver and spleen imperceptible to touch.

Urine: sp. gr. 1010; albumen $\frac{3}{4}$; no guaiacum reaction. Sediment of amorphous urates, large epithelial cells, pus globules and casts, some granular and some not, in size from middling to large.

In other respects much as before.

September 5.—No fever since admission.

Anasarca has gone. Albuminuria has been gradually diminishing, but at no time has there been less than one-third.

October 11.—No fever.

Dropsy has returned for two weeks, and now is considerable.

Diarrhœa has become very troublesome of late.

October 29.—Dropsy gradually increasing. Urine always highly albuminous.

Diarrhœa continues.

Quite blind for some days, but changes in left eye much as they used to be.

December 12.—For a long time now has been very dropsical. Urine always highly albuminous. Temp. below normal. Diarrhœa very obstinate.

Speech has become more and more tremulous and indistinct;

[1] Ophthalmoscopic report by R. M. Gunn, M.B.

it is now quite impossible to make out what she tries to say. No obvious paralysis of any limb.

Next day she died.

*Post-mortem examination* forty-one hours after death.

General dropsy.

Skull-cap natural.

A small old adherent thrombus in the middle of the upper longitudinal sinus, and another in the torcular Herophili.

Pia mater over convex surface of both hemispheres thickened and opaque; much more marked over left.

Much atrophy of left hemisphere, and perhaps a little of right. Left is about an inch shorter from before backwards than right.

Left hemisphere: membranes stripped off with very great difficulty. Convolutions harder than natural, and sulci very deep in the præfrontal region, reaching to the margin of the longitudinal fissure, but not quite down to the corpus callosum. Here the colour also of the convolutions is changed, resembling that of potted shrimps. A little induration of the middle part of the ascending frontal convolution, and of middle and upper parts of ascending parietal. Island of Reil natural. Third frontal convolution indurated at upper anterior part, but not at lower part near island of Reil. Some induration just below fissure of Sylvius, in first temporo-sphenoidal convolution.

Right hemisphere: in præfrontal, frontal, and parietal regions the sulci are widened, and the convolutions are shrunken and feel harder than natural. On section through an indurated portion, the grey matter is very firm, increased in depth, and of a pale gelatinous look.

Posterior cornua of lateral ventricles a little dilated. Ependyma minutely striped. Left corpus striatum, thalamus opticus, and corpora quadrigemina are smaller than right, especially the thalamus opticus, which has a worm-eaten appearance on the surface. No obvious change on section.

Left crus cerebri, left half of pons varolii, and of upper part of medulla oblongata smaller than right. Right optic nerve smaller than left. Both middle cerebral arteries diseased, showing nodules of gelatinous look, more so on right side. Cerebro-spinal foramen closed by thin old lymph. Spinal cord soft from commencing decomposition; grey matter in cervical region much more pink than elsewhere; no obvious want of symmetry.

Left pleura adherent; lung collapsed and tough, weighs $3\frac{3}{4}$ oz. Right lung much congested and rather tough, weighs $6\frac{1}{2}$ oz. Pericardium natural. Heart natural, $2\frac{1}{2}$ oz. Aorta and bronchial glands natural.

Liver, $19\frac{1}{2}$ oz.; spleen, $1\frac{3}{4}$ oz. Both natural; no iodine re-

action. Pancreas, suprarenal bodies, and mesenteric glands natural.

Kidneys a little enlarged; capsules not adherent, but surface slightly granular, of a pale fleshy pink colour. On section, cortex increased in depth, much confused, scattered over with very many whitish yellow spots, one the size of a hempseed in medullary portion of kidney. No iodine reaction. Weight, 6½ oz.

Small intestine: eight annular deeply pigmented constrictions marking the site of ulcers, which, all but one, have healed, and in that one the healing was all but complete. One Peyer's patch shows slight recent ulceration. Mucous membrane of both large and small intestines much reddened, and thicker than natural. No iodine staining.

*Microscopic examination of the brain by Dr. Abercrombie.*—Brain examined after hardening in Müller's fluid. The superficial layers of the cortex present no change; the deeper layers show a remarkable absence of nerve cells; no true multipolar cells can be seen. Throughout the grey matter there is an unusual amount of neuroglia.

### *Paralysis due to Compression of the Arm.*

A man falls asleep in such a posture as to squeeze his upper arm. When he awakens he can neither bend nor straighten the wrist or fingers; below the elbow the limb is wholly palsied; it is wholly benumbed in feeling also.

Of this accident the earliest record which I know is to be found in De Haen. "Marcus Krafft somno obreptus, capite suo incumbit brachio dextro. Expergefactus deprehendit totum brachium, manum, digitos, omni prorsus motu carere. Sensus admodum paucus adest: pollex vero et index interne externeque frigidi, ne vellicati quidem quidquam sentiunt. Malo jam 19. diem numerante, ad Machinam [electricam] accessit: vires ejus 19. diebus expertus, sanitatem integerrimam recuperavit."[1]

The compression of the arm sometimes lasts for hours, because the sleep is often the sleep of drunkenness. Joseph Frank had noted this: "J'ai vu un homme qui, dans un état d'ivresse, avait passé toute la nuit dans un profond sommeil, la tête recouverte du bras et de la main droite, se réveiller avec la paralysie de ces parties."[2] If the compression have not been long lasting, recovery is speedy; feeling, attended by what are called pins and needles, returns first of all; next the flexor muscles regain their powers; and lastly the extensors. But if the compression have

[1] Rationis Medendi pars quarta, cap. vii. p. 247, Vindobonæ, 1759.

[2] Praxis Medica, French translation, Paris, 1838, vol. iii. p. 393, n. 82. "Diseases of Nervous System," c. xxxviii. s. 3.

been prolonged, the paralysis may last several weeks at least. In these cases tonic contraction of the flexors sometimes comes on; not, so far as I have seen, amyotrophy; the palsied muscles act well to electricity of both kinds. The treatment consists in warmth, rubbing, and electricity; and is mostly successful. Graves and Todd narrate cases which were incurable. "A case was related to the late Dr. Brennan and myself, in which a robust gentleman, having been much fatigued during the day, fell asleep after dinner, his head resting on his arms, which were crossed on the table. In consequence of some unfortunate awkwardness in his position, one of the ulnar nerves was compressed during the time he slept; and on awakening, his forearm and hand were completely powerless. Many remedies were tried, in this case without success, and the paralysis continued until the day of his death, which occurred several years afterwards."[1]

Three different causes may be assigned to this palsy.

I. Duchenne deems it to be a paralysis *a frigore*, due to exposure of the arm to cold. He unfolds his reasons for this opinion at some length,[2] but inasmuch as they seem to me unsound, I will not rehearse them here.

II. Much more commonly it is supposed that the palsy depends upon injury to the nerve trunks of the arm. Graves in the passage just quoted speaks of compression of the ulnar nerve; an inadequate cause, surely, of the complete paralysis of the forearm and hand from which the patient suffered. Todd writes thus: "Paralysis produced by pressure on the axillary plexus of nerves is not of uncommon occurrence. I have seen some cases in which it was produced in the following way. A man gets intoxicated and falls asleep with his arm over the back of a chair; his sleep under the influence of his potations is so heavy that he is not roused by any feelings of pain or uneasiness, and when at length he awakes, perhaps at the expiration of some hours, he finds the arm benumbed and paralysed. It generally happens that the sensibility is restored after a short time, but the palsy of motion continues. Cases of this kind sometimes derive benefit from galvanism; but if the pressure which caused the paralysis has been very long continued, they seldom come to a favourable termination."[3] Against this supposition lies an objection, namely, that a lesion of the axillary plexus might be expected to paralyse the upper arm no less than the forearm; and such indeed is the fact when the axillary nerves have been compressed by the top of a

[1] Graves: Clinical Lectures, 2d ed., Dublin, 1848, vol. i. p. 557.
[2] De l'Electrisation Localisée, 3d ed., p. 703, Paris, 1872.
[3] Cinical Lectures on Paralysis, 2d ed., p. 16, London, 1856.

crutch in the armpit. In the kind of paralysis whereof we are speaking, nerve-pressure, if it be the cause, cannot operate much below the axillary plexus, else the musculo-spiral nerve, passing to the outer side of the arm, would escape, whereas it suffers more than the median and ulnar nerves. So that the local injury must be high up before the musculo-spiral passes backwards, and yet so as to spare the musculo-cutaneous. But even this supposition does not take away the whole objection; for why should the triceps brachii escape being supplied by the musculo-spiral?

III. A third hypothesis; the pressure acts somewhere about the middle of the inner side of the upper arm, and so as to stop the flow of blood through the brachial artery.[1] In other words, the palsy is ischæmic, and due to arrested nutrition of the nerve-endings: a topic upon which much has been written from the days of Steno downwards. The chief objection to this hypothesis is that ligature of the main artery of a limb sometimes causes paralysis, and the paralysis is attended by speedy loss of faradic irritability, and also by amyotrophy; symptoms which do not attend the pressure paralysis of which we have been speaking. But there is an important difference between the two cases put: in the one the arterial obstruction is permanent and complete; in the other it lasts not more than a few hours at most, and is not necessarily complete at any time.

Yet, after all, we sometimes meet with cases not readily explained by any hypothesis. Some time since I saw a policeman who, a week before, had slept upon his right arm for an hour and a half, and awoke with the limb paralysed. When I saw him, the paralysis affected the extensors and flexors of the wrist, fingers, and thumb, the interossei and other thumb muscles, and also the triceps extensor of the elbow: the supinators and pronators of the forearm seemed natural. All the muscles reacted well to the faradic current. Paralysis with this distribution would seem to be most likely due to lesion of a nerve trunk. Probably the outer side of the arm was squeezed

[1] "The immediate cause of palsy is always an obstruction of the nervous fluid in its course from the brain to the paralytic muscle, or of the arterial fluid in its course the same way."—*Boerhaave, Aphor.* 1058. "Experiments teach us that an artery being tied, before its distribution into a muscle, destroys the motion of that muscle."—*Van Swieten, in Aphor.* 660. "In the cure of an aneurysm of the arm, while, by the trunk of the brachial artery being tied, the passage of the blood into the muscles below it is hindered, or at least considerably diminished, surgeons have observed a numbness of the hand, and sometimes a palsy in some of the fingers; which complaints, however, have afterwards disappeared, when the branches which go off from the artery above the ligature, being gradually more dilated, conveyed a proper quantity of blood to the hand."—*Van Swieten, in Aphor.* 1059.

as well as the inner side. Yet all the muscles supplied by the musculo-spiral nerve were not paralysed. Perhaps the nerves supplying the triceps were directly injured. The flexors of the elbow-joint were natural.

*Traumatic Myelitis—A Fall out of Window followed by Muscular Atrophy and Muscular Rigidity.*

Anne T., aged 9½ years, admitted into the Hospital for Sick Children on May 29, 1878. The notes by Dr. George Garlick.

On March 24, 1878, she had a feverish sore throat; the next day she went to bed apparently much better. At 10 P.M. a neighbour knocked at the front door and said that a child had fallen from a window on the third story. This was a height of about forty feet. She fell on a grating and earth. She was unconscious when picked up, and remained so until 2 A.M. March 26. She was paralysed and insensible in arms and legs. It was observed that when her neck was moved she passed urine and fæces into the bed. No swelling about neck; swallowed well; speech good; no facial palsy.

After one week she began to amend; sensation returned first; whilst it was returning she said she felt pins and needles.

Four weeks after the fall she could move her arms a little; about the same time she could tell when she wanted to pass water.

The leg has been getting stiff for three weeks.

*State on admission.*—Legs: muscles ill nourished. 1. Left: feeble voluntary power over all joints, except over the little and fourth toes, where it is quite lost; sensation natural. 2. Right: rigidity of all muscles, those of the hip-joint and downwards; hence all joints stiffly extended; foot inverted also. Rigidity not always present; leg sometimes quite relaxed; rigidity not wholly removed by chloroform. The leg is sometimes involuntarily drawn up to the body. Faradisation produces the same result by powerful reflex flexion of all the joints. Tickling the sole has not this effect. Well-marked ankle clonus. Sensation natural.

Arms: muscles ill nourished. Paralysis and great amyotrophy of extensors of wrist and fingers in both forearms; also of muscles of ball of thumb, and indeed of all the small muscles of both hands; the wasted muscles of the forearms contract to faradism; those of the hands not so. Great rigidity of flexors of fingers of both hands. Sensation natural.

Lower part of right pectoralis major much wasted. Latissimus dorsi, trapezius, serratus magnus seem natural.

The muscles of the back look much wasted; back hollow; spine strongly curved, with convexity to right, but by posture and traction this can be overcome. Cannot sit up without help; when she sits up the curvature becomes extreme, so that the left side of the chest looks quite contracted and the right bulged.

The seventh cervical and first and second dorsal spines are prominent; the child points to them as being the place where she felt pain after the fall; but there is no deformity, and all the movements are free and painless.

The chest hardly moves in breathing; the respiration is abdominal, and the right side moves much more than the left.

The wasted muscles of the forearms were ordered to be faradised daily; straight splints were applied to the flexor surface of the forearm and fingers, so as to resist the rigidity of the flexor muscles. There was not much improvement.

July 14, 1879, seen by Dr. Abercrombie, who made the following notes:—Cannot sit upright; in sitting posture there are an apparent angular curvature in the dorsal region and lateral just above it, but they quite disappear when she stands up. Good power in biceps of each arm; forearms rather wasted. Hands cold, and with a tendency to wristdrop; interossei and muscles of thenar eminences wasted; thumbs partly bent on palms; very little power of moving them; fingers partly flexed; has more power of moving them, but cannot extend hand with fingers outspread; grasp very feeble; right hand more affected than left. Right thigh flabbier than left; right leg colder than left; cannot flex right ankle-joint; ankle clonus well marked on right side. Left leg natural. Can just stand alone; can walk with help; valgus of right foot. Breathes mainly with diaphragm.

### *Motor Ataxia of Legs—Diplopia—Paralysis of Orbicularis Oris.*

John G., aged 35 years, admitted on May 28, 1880. The notes by Mr. O. Browne.

He had syphilis sixteen years ago. He has been a free drinker.

Three months ago he first noticed that when he looked to the right side he saw things double; one image being alongside the other. At the same time the left eyelid drooped a little.

Two weeks later he felt a numbness on the left side of his face. At the same time he lost the use of his lips; food would gather between his lips and his teeth; he could not whistle; he could not play the cornet, as he had been in the habit of doing.

About the same time the right foot became numb; and a fortnight later, the left foot.

Legs: sensation not affected above ankles; below ankles, sensibility is much lessened, especially on the right side. No pains anywhere.

Gait unsteady; he keeps his feet far apart in walking, and raises his feet but little; he has difficulty in turning; he can stand with his feet close together, but unsteadily. Muscles well nourished.

Patellar tendon reflex absent in both legs.

Micturition normal, unless he takes longer time than he did to pass water. Defæcation normal. Urine normal.

Diplopia and ptosis. He says he sometimes sees double now when he looks to the left. Slight ptosis of the left eyelid. No strabismus; ophthalmoscope shows nothing unnatural.

He cannot keep his lips firmly together when he tries to blow. The orbicularis oris cannot be made to contract by faradism. By galvanism it contracts well.

All other functions natural.

He took small doses of corrosive sublimate. The orbicularis oris was galvanised daily. There was a rapid improvement in the state of the lips under this treatment. On June 18 they contracted under faradism; by the end of the month their condition was almost natural. The ataxia of the legs remained unchanged. Before he left the Hospital he complained of squeezing pains in legs and feet.

This case seemed worthy of record on account of the association of partial facial palsy with motor ataxia of the legs.

### *Teichopsia.*

The writer of the notes following is a gentleman most distinguished at the University of Cambridge by his mathematical attainments. He was attending my course of lectures last winter, when he recognised, in the description of teichopsia,[1] an ailment from which he had suffered.

March 14, Sunday, 10 P.M.—First attack since my attention called to it.

Indoors all day reading and writing. Felt towards evening some premonitory dimness, but no headache or megrim signs. Suddenly, after half an hour's reading of the small print in Bellow's French Dictionary, I was conscious the teichopsia had

[1] Hubert Airy, "On a Distinct Form of Transient Hemiopsia." Philosophical Transactions, vol. clx., p. 247. Also Edward Liveing, "On Megrim, Sick-Headache, and some Allied Disorders," p. 70.

begun, though I could not say when it had started. Faintly luminous, jagged, "swarming" half-circle, referred to outer half of left eye, the convexity of the curves being outwards. Can see what I look at directly; the jagged curve evades my direct gaze. Quite unaffected by shutting eyes; rather brighter when the lamp is turned down; not affected by pressing on eyeball, though that makes an independent instantaneous flash. The appearance moves as I move my eye or head; by no means can I bring myself to feel that the right eye has any part in it. It is growing slowly, though in incessant outward movement like a magic-lantern chromatrope. The boundary is of four or five parallel lines of various thicknesses, alternately brown and yellow; the colours and look of a polyanthus immediately suggested. No other colours certainly observed. The fortification type becomes less distinct as the figure grows, and the lines are curved and interwoven. At first the field within the figure and without it were both alike dark. In half an hour or so, as the thing began to fade, the inner field became intermittently bright, like a sky in which clouds are scudding over the moon. As I write this, it all becomes more and more faint, and more and more on the border of my field of view. I have no headache or any symptom of migraine.

After an hour the whole thing is over, having simply dwindled and ceased to squirm and flash. All that is left is a spot of dimness in my left eye, which is central, for it hides the letter I am actually writing, though I can see all the others. This dimness is not perceived when I shut my left eye and write with the other. At 11.30 the dimness is gone; there is a slight feeling of soreness over right side of head.

*Second Attack.*—[I have not looked at my notes on the first attack since I wrote them; these notes are altogether independent.]

May 21, 1880, 11 P.M.—I woke this morning with a slight hemicranial headache, confined to left occiput, and worse on movement. Had not slept very well for some nights before, and had been taking 15 grs. bromide of potassium out of hst. gentianæ c. rheo, once or twice daily, with apparently slight effect. Coffee at breakfast dispelled the headache for a time, but I could feel its presence all day on jerking the head suddenly. Had two "teas" in the course of the afternoon (three or four cups). Felt quite well as evening came on. Took no dinner, as I had no appetite [? two teas], and went to a lecture by Mr. Spottiswoode at the Royal Institution at nine o'clock. Subject, electricity *in transitu;* experiments with vacuum tubes; flickering striations, vague luminosity variously tinted, and some

minute phenomena requiring peering through a field-glass. After lecture chatted with friends, seeing perfectly; then got into a 'bus to come home, and on looking at face of my *vis-à-vis*, saw suddenly the familiar zigzag halo across his face. In a minute the thing was in full swing; *felt* as if altogether in left eye, though not certainly so; brilliant parallel zigzags forming an irregular semicircle concavity to right, and not quite opposite centre of field, rather to left. The colours mainly brown and yellow, with a suspicion of faint blue. A luminous cloud at lower point, with distinct blue in it. The "swarming" and "seething" movements rapid and considerable. The jogging of the 'bus seemed at times to shake up the figure. Seen which ever eye I shut, but is *least* distinct when I open the right and close the left. This owing to distraction of vision (internal and external), for by concentrating my look on the "zigzag," I can project it on anything I gaze towards. Forms changed rapidly from rectilinear to curved and convoluted, colours becoming paler, and parallel bands merging into one or two. At the same time, across the grey luminous field enclosed by the semicircle shot constantly somewhat brighter crossing lines, suggesting K's and X's. At the same time, on looking at a woman's face opposite me, I saw that her right eye (opposite my left) was invisible; this was the case whether I looked with my right eye alone or with my left alone. No sharp cutting off of half the face, but rather a portion *not seen*, with much the same impression as when an object is projected on the "blind spot." Turning to a sign on a shop-front at which we stopped, I saw . . . CE of the word PRINCE, when I looked full at it, and this with either eye alone. Moving my head to the left, the whole word came into view. This did not last long; the semicircle was getting dimmed, wider, more sluggish, and seemed approaching the limit of the left field of view. At last it became quiescent, colour died away, a faint nebulosity seemed to occupy left eye, bounded by something I could neither look over nor clearly define (much as when you look down at the tip of your nose). Even this died away rapidly, and before reaching the Hospital all the appearances had gone, and I saw everything quite well. The whole affair thus lasted about twenty-five minutes. I write this at once on coming in, as everything is vivid on my mind; and I took the precaution to express to myself in words what I saw as each thing passed before me. What I want specially to note is, that though I was thinking about the lecture, and mentally recalling the experiments, clearly "visualising" them, nothing derived from them was imported into my involuntary spectrum. The mental picture

and the cerebral one were perfectly distinct throughout. I am now left with some increase of headache over what I had in the morning; it is not so clearly localised, though rather worse on *right* side, and it is still made worse by shaking. I have not had a walk for ten days or more, having had a certain stress of examination work to get through, and I have been somewhat constipated for a week, a very unusual thing with me. No other symptoms to note.

### *Infantile Spinal Paralysis.*

Sir Walter Scott's lameness was doubtless due to an acute infantile spinal paralysis; or, after Kussmaul, polio-myelitis anterior acutissima; after Charcot and Littré, téphro-myélite antérieure aiguë parenchymateuse; after Vulpian, acute anterior spodo-myelitis; after Martineau, acute anterior phæo-myelitis. "One night he had a great aversion to go to bed, and it was not till he was chased round the room and laid hold off, that he could be prevailed upon to comply with the wishes of his mother. In the morning he was affected with fever, and after three days it was discovered that he had lost the use of his right leg." This was about the year 1774, before Underwood brought out his book, which is said to contain the earliest description of the disease.

# PURPURA IN CHRONIC NEPHRITIS.

BY

SAMUEL GEE, M.D.

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The following three cases are examples of the occurrence of purpura in nephritis.

With regard to the relation between the nephritis and the hæmorrhagic tendency (manifested as purpura), this may be said: there seems to be no reason for believing that the albuminuria is only a part of the hæmorrhagic tendency. Either the nephritis may be deemed to be, in some way, a cause of the purpura, or both nephritis and purpura are due to an underlying common condition of disease. Of these two suppositions, the latter would seem more likely. Indeed, we know of one condition which does produce both purpura and albuminuria, namely, the amyloid degeneration. Yet, in the following cases, there were no grounds for supposing the existence of amyloid disease.

The urine was not only albuminous, it was also bloody now and then, but by no means constantly; exudation corpuscles and tube casts were mostly to be found in the sediment.

The albuminuria was in all cases abiding; the children left the Hospital with urine still albuminous. But the purpura was very temporary, and far from being constantly present.

The onset of the illness was attended in all cases by diarrhœa, with blood in the stools, and in two cases by vomiting.

Excepting the blood in the urine and stools, the hæmorrhagic disposition was manifested in the skin only; that is to say, the mucous membranes did not bleed.

No discoverable disease of lymphatic glands, spleen, or blood.

The purpura, in the second case, began as a very swiftly spreading erythema; that is to say, the patches of redness at first disappeared upon pressure.

The patients did not take iodide of potassium.

### Case I.

Emma Jane V., aged 9 years. In the Hospital for Sick Children from April 2 to July 17, 1878. The notes by Dr. George Garlick.

Her mother died of pulmonary consumption.

The girl was in her wonted health (never very good) until the middle of January 1878, when spots were first seen on her legs. Soon afterwards deep, painful, reddish swellings formed on the calves. Two weeks ago a large red blotch came out on the back of the knee, also blotches of the same kind on each side of both ankles; these have now turned to blisters full of bloody liquid.

At the beginning of her sickness she had pain in the right side of her belly, diarrhœa, and blood in the stools, lasting for one day.

She has become much thinner and paler.

She has always had plenty of vegetable food.

Her urine is said to have been bloody for a month gone.

April 2.—Complexion very sallow; greenish.

Gums a very little spongy.

No enlargement of lymphatic glands. Spleen impalpable.

Liver natural.

No excess of leucocytes in blood.

No physical signs of disease in chest.

Urine is of a slight brown tinge; gives no reaction with guaiacum and ozonic ether; contains a trace of albumen.

On each buttock a small purpuric patch; that on the right side seems to correspond to a deep effusion of blood. Behind right knee a large purple blotch, the lower part of which is covered by a blister with bloody liquid. Outside each ankle is a superficial ulcer, in the seat of a former purpuric patch. On arms and legs numerous remains of purpuric spots, which now form small pimples.

April 4.—Body-heat now and then rose to 99°–100°; otherwise was natural throughout the whole illness. Urine to-day browner; no guaiacum reaction; numerous exudation corpuscles and one hyaline cast found in the sediment; more albumen.

April 8.—Marked puffiness of hands.

April 12.—A few new purpuric spots on legs.

April 19.—Urine: 840 cub. cents. in twenty-four hours; sediment of coagulated albumen one-fourth.

The amount of albumen in the urine varied very much from day to day. Thus, on May 4, only a trace; May 9, a large quantity; May 22, one-fourth; May 27, very little; June 3,

urine loaded with albumen. The guaiacum reaction could sometimes be obtained. Indican was often present when tested for by Heller's method. Blood corpuscles, exudation corpuscles, and a few granular casts in the sediment.

July 17.—Discharged. All signs of purpura gone. Complexion of a better colour. Urine, one-sixth of albumen, smoky, and giving a marked guaiacum reaction. No anasarca. No hæmorrhage from any mucous membrane whilst in Hospital.

## Case II.

Elizabeth G., aged 7 years 2 months. In the Hospital for Sick Children from July 14 to September 22, 1879. Notes by Dr. Abercrombie.

On admission she was said to have suffered for eighteen months from hip-disease, which was attributed to a fall downstairs, and had been treated for seven months by keeping the child face downwards on a board.

Five weeks ago she was thrown out of a perambulator. Next day vomiting and pain in the pit of the stomach. Two days afterwards blood in the stools, which lasted until a few days ago; no tenesmus; frequent action of bowels.

One week after the fall she complained of feeling bruised in her feet; when they were looked at, a rash was seen upon them, bright red, raised, round patches; the rash spread so quickly that in two hours the thighs were covered; next day there was a purple look about her ankles and up her legs. The rash was confined to the legs, and lasted a few days only.

Some time afterwards had a similar attack, which passed off in the same way.

This morning the rash came out again, and this time spread over the whole body. When she left home there was no purpleness, but by the time she reached the Hospital there was a little purple look about the ankles.

Each time the rash has come out the ankles have swelled a little. On the first attack the knees swelled also.

July 14.—Soon after admission was crying much with pain in right ankle. Both ankles swollen, especially the right; swelling pits on pressure. Temp. 99.8°.

July 15.—Temperature natural this morning, and also throughout the rest of her stay in the Hospital.

No pain in feet now.

Chest natural. No enlargement of lymphatic glands, liver, or spleen.

The rash is pale pink, hardly at all raised, fading on pressure,

but only for an instant; in some places an aggregation of spots, each no bigger than a lentil; in others there is extensive diffuse redness.

On the arms a few spots. In the armpits, at the bends of the elbows, and on the backs of the wrists, there is a more diffused redness; minute ecchymoses, scattered over these large patches, give them a mottled look. On the neck a few patches. Trunk almost free from rash. Eruption is much more extensive on the thighs and legs than elsewhere. Blotches over both buttocks and sacrum; also in the hams, and along inner sides of thighs and legs; ankles and insteps covered by a continuous patch of redness. Around both ankles, in front and at the sides, subcutaneous hæmorrhage has taken place, so that there is a well-marked patchy and spotty purpura.

Urine: one-fourth of albumen; high coloured; sediment shows blood disks and large squamous epithelial cells; no renal casts or exudation corpuscles.

No sign of any hip-disease now.

July 16.—Rash has faded very much from right leg, so that now there is only a faint brown patchiness. On left leg also eruption has faded, but less. No swelling of feet now. No blood in stools.

July 21.—Urine: albumen one-half; in sediment a great many blood corpuscles and a few hyaline casts.

July 31.—No fresh eruption since last note; purpura about ankles has not yet disappeared. Urine: one-fourth of albumen; pale amber; strong reaction with guaiacum test.

August 1.—Urine: very smoky, and turbid with urates; three-quarters of albumen; microscopically, many blood corpuscles, and a few large casts slightly granular.

August 16.—The old purpuric patches about the ankles have turned brown, and are coming off like small scabs. No new purpuric spots.

Some new erythematous spots and blotches of irregular shape, not raised, pale red, fading on pressure, the smallest the size of a split pea, on the insteps up to the ankles.

August 18.—Last evening came out on the back of each forearm an oblong patch, 2½ inches by 1, bright red, hardly raised, distinctly tender. A similar patch on back of right arm just above elbow, and some spots on left elbow. Backs of hands became swollen last evening, and are so still. Urine: one-eighth of albumen. No fever.

August 23.—Rash on feet did not last more than a few days. Patches on arms have behaved just like bruises, and are now yellowish green; not raised, not tender. Quantity of albumen

in urine very variable; two days ago a mere trace, to-day one quarter.

September 8.—Has been allowed to get up the last few days. On instep of both feet, over a space about the size of a crown-piece, is a slight greenish-yellow tinge of skin, and many irregular patches of different shades of purple, not raised, unaffected by pressure; this eruption was not present yesterday; no œdema. No rash anywhere else. Albumen in urine about one-tenth.

She was treated for a time by strict milk diet; but neither this nor the drugs employed were able to remove the albumen wholly from the urine. She was discharged on September 22.

### Case III.

William G., aged 5 years. In the Hospital for Sick Children from June 15 to July 12, 1874. The notes by Dr. Barlow.

His father is consumptive.

Six weeks ago he fell on a stone step and bruised the small of his back; the bruise went away in two or three days.

Next day his legs swelled, and the day afterwards his face, so that he could not open his eyes. At the same time his belly became big, and lasted so until June 12.

When the swelling began he passed very little water, a small teacupful in two days; high coloured, with a sediment. Afterwards, as his mother says, pure blood. Scantiness of urine lasted one week, then quantity became more natural.

At the onset of his illness he vomited for three days. When the vomiting stopped he began to pass blood with his stools; the first two days he very often passed bright red lumps of jelly. No blood in stools for three weeks gone.

In the second week of his illness there was a "scurvy" on his legs, and some blue patches on his feet.

No rash, sore throat, or other sign of illness before the time of the fall spoken of above.

June 16.—Nothing noteworthy in general condition except that he is rather pale. Murmur following first sound of heart at apex, but no signs of dilatation or hypertrophy. Temperature natural.

A little dropsy about ankles.

Some broad purplish patches ankles.

Urine: slightly smoky; one-eighth of albumen; under microscope many blood corpuscles and a few small hyaline casts.

On June 26 some patches of purpura appeared on the thighs and soon faded. The urine continued albuminous to the amount

of one-eighth or one-tenth. From June 23 to July 3 there was some elevation of temperature daily; on June 30 it rose to 103°; this was the highest.

On July 8 the fever of what turned out to be measles began, and when the rash appeared on the 11th, the boy was sent away from the Hospital.

# FOREIGN BODIES IN THE AIR-PASSAGES.

BY

SAMUEL GEE, M.D.

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CASE I.—*Plugging of the Right Bronchus by the Kernel of a Fruit Stone.*

Lily J., aged 2 years 2 months. Admitted into Mary Ward on May 4, 1880. The notes by Mr. Harper.

She was in her usual health until 5 P.M., May 1, when she was suddenly seized with a very severe fit of coughing, gasped for breath, became blue in the face and tongue, almost lost consciousness. This state lasted from fifteen to twenty minutes. On recovery, she was understood to say that she had swallowed a bone. There was an uncooked haddock on the table, but it could not be made out that a bone had been taken away.

She seemed to recover completely, and slept soundly all night.

Next morning (May 2) her breathing was whistling; this soon passed off, and she was running about all day, taking her food well, and seemingly having nothing the matter with her. During the night she was rather restless.

May 3.—In the morning she was drowsy. In the evening she had a second fit of coughing, such as happened on May 1, and soon afterwards was brought to the Hospital.

May 4, 3.30 P.M.—Great lividity of face and lips. Great dyspnœa, manifested more by a look of anxiety than by excessive breathing movements. She can lie down and sleep lying.

Inspiratory recession of the base of the chest on both sides; not great, and not more marked on one side than on the other. Upper part of chest in front expands less on right side than on left. The heart is beating almost wholly to the right of the sternum, and is raised also much above its proper level. Clear percussion note over the left side, back and front; no heart dulness to left of sternum. Note impaired over whole right side; absolutely dull below nipple level, back and front. Liver no

doubt raised. Breathing sounds on left side puerile; on right side very weak, except over the apex; at root of right lung highly bronchial; no whistling sound.

Throat natural. Temp. 102.4°. Pulse, 198, but quite distinct. Resp. 68. Other functions natural.

In spite of the vagueness of the story that the child said she had swallowed a bone, and in spite of the fact that she was perfectly well all the next day, yet so strongly did the physical signs seem to point to extensive collapse of the right lung, that it was deemed most likely that the right bronchus was plugged with a foreign body. It was decided to search the bronchus; at 4.10., P.M., Mr. Marsh performed trachæotomy, and passed long curved forceps, but could not feel or withdraw anything. A trachæotomy tube was put into the trachæa.

May 5.—Seems worse; great distress and dyspnœa; heart felt more to the left; physical signs otherwise the same. Temp. 97°. Pulse, 207. Died at noon.

*Post-mortem examination.*—The position of the thoracic viscera did not correspond with the physical signs described as being present on the 4th; there can be hardly any doubt that a change took place during the twenty succeeding hours of life. The heart was in its natural position. The right wing of the diaphragm certainly did lie high. The upper lobe of the right lung was emphysematous, vesicular and interlobular. The lower lobe and lower half of the middle lobe were completely collapsed. The trachæa and bronchi contained much purulent mucus. Imbedded in this mucus, in the right bronchus, some distance below its bifurcation, was the kernel of a fruit stone (most likely a damson), about the size of a cherry-stone, but flatter; like a lentil, but bigger. All the other organs were natural.

The whole specimen is preserved in the museum.

### Case II.—*A Piece of Bone Lodged in the Windpipe for Three Weeks.*

The patient in this case was a clergyman of middle age, who shall be allowed to narrate his own story.

"On the 28th October, at dinner, I choked on a piece of veal bone, which felt as if sticking somewhere, though I could swallow with ease. I spent the evening in much discomfort, and passed a very bad night, suffering much from difficulty in breathing. I came up to town next morning, and was so much easier for the railway shaking, that I deferred my visit to a medical man until next morning. I had then just the appearance

of a cold on my chest. I saw Sir ——— in the forenoon. He said the bone was not in my throat, and had most probably slipped down, but that I seemed to have a cold (to which I am at all times subject), and had better keep in the house. On November 2 I went to Oxford, and suffered all the week as from asthma, the want of breath causing rather acute pain in mounting stairs. I coughed now and then, and always with a very bad taste at the back of my throat. I could not lie on my right side; this invariably increased the wheezing and brought on coughing. On the 7th I returned to town, and was treated as for bronchitis, but without the slightest relief. Twice I had a fit of coughing, violent, almost convulsive. Occasionally the tightness of the breathing had interfered with my sleep, but I had not much to complain of on that score. I suffered no pain. November 16, I came to C——, and probably got a chill on the journey. On the evening of the 18th I went to bed with a headache; next morning Mr. ——— came to see me. After two nights, the cold and pains in the limbs were better, but nothing would stay on the stomach, and the exceedingly bad taste in the mouth increased. The cough also became more troublesome. On the Sunday, November 20, I had a very bad afternoon, followed by a sleepless night. Between four and five o'clock next morning, feeling increasing difficulty in respiration, I called up my servant and had hot flannels applied to my throat and chest. This gave some slight relief, and I dozed off for a quarter of an hour, waking up feeling more dead than alive. As soon as it was day, I sent the servant to call some one to fetch the doctor, and during her absence, with one cough I brought up the piece of bone. There was a feeling of instant and perfect relief, and I had no further illness or inconvenience."

I may add that the piece of bone is preserved in the museum. It is very cancellous, very light, and deprived of all but the calcareous framework.

# SOME CASES OF ABDOMINAL SURGERY

(WITH REMARKS).

BY

HOWARD MARSH.

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## I.

*Intestinal obstruction, apparently due to Hernia—Exploration of inguinal canal—Internal strangulation detected—Abdominal section—Relief of symptoms—Death, from septicæmia, on the tenth day.*

J. B., a carman, aged 45, habitually very intemperate, admitted on December 8, 1879. The notes, by Mr. Cripps (Surgical Registrar), state that the patient was so ill that only an imperfect history of his case could be obtained. He said, however, that he was quite well on the previous day, but on going to bed at 10 P.M. he felt severe pain in his abdomen, and was attacked with vomiting, which continued to be violent and frequent all through the night.

On reaching the Hospital he was in a state of collapse; pulse rapid and very small; skin cool and damp; features pinched, expression that of extreme distress; hiccough frequent; no sickness for about an hour. During the night he had taken several purgative doses, but they had been immediately rejected.

On examination, a tense conical swelling, about an inch and a half long and as big as the end of a thumb, could be felt at the upper part of the left inguinal canal, and the patient said he had from time to time noticed a tumour of considerable size in this situation, but it had given him no trouble, and had always spontaneously disappeared. In the left side of the abdomen, in the neighbourhood of the inner half of Poupart's ligament, and extending towards the middle line, there could be felt, through the abdominal walls (which were loaded with fat), a deeply seated obscure tumour of the size and flattened shape of a large

inverted tea-saucer, firm, inelastic, and very tender on pressure. Thus the case presented very unusual features; yet there could be no doubt that the nature of the swelling in the inguinal canal should at once be ascertained. When exposed, it proved to be a hernial protusion through the internal ring. As no stricture external to it could be found, the sac was opened. As soon as this was done a large quantity of turbid serum gushed out to a distance of eight or ten inches, and in a very short time some fifteen ounces poured out from the abdominal cavity. The sac was now found to be empty and collapsed, and the finger passed easily through its neck into the general cavity of the peritoneum. Searching in the neighbourhood of the internal ring, I came at once on the tumour which had been detected through the abdominal wall, and found it to consist of coils of distended intestine, but I could not reach far enough to ascertain how they had become strangulated. As no means of relieving the patient except abdominal section remained, this operation was performed after the urine had been drawn off. On opening the peritoneal cavity by an incision four inches long, extending downwards from the umbilicus, and introducing my finger, I discovered, a little to the left of the middle line, and at a depth of less than two inches, a firm dense ring about an inch and a half in diameter, and with a well-defined, rounded, indurated border; and through this ring a considerable length of small intestine had slipped. Bringing the ring forward into the wound, I divided it with a blunt-pointed hernia knife, and drew out about twelve inches of small intestine that had passed through it. The intestine was deeply congested and of a puce colour, but not so far injured as to be in danger of gangrene or rupture. The ring, it could be seen, was in the great omentum, but its precise formation could not be ascertained. The parts lay so near the surface that the operation was performed very easily and without bringing the intestine through the external wound. The incision was closed with deep and superficial sutures and supported with wide pieces of strapping, and a flannel bandage. At 8 P.M. the patient was comfortable; temp. 101.3°; no vomiting.

9th.—Has passed a fairly good night; abdomen less distended. A large quantity of flatus has passed from the bowel. No anxiety of face. Temp. 101.2° To take nothing but milk in small quantities, and ice.

10th.—Not so well. Complains of much abdominal pain. Temp. 103°. Wound looks healthy.

11th.—Passed a very fair night, after taking a third of a gr. of morphia. Temp. last night, 102.6°; this morning, 101°. Bowels open twice; rather relaxed.

12th.—Good night. Complains of some pain; pulse 84; abdomen distended and tympanitic, but only slightly tender.

13th.—Restless night. Complains of great pain in the abdomen. Pulse 90, volume good. Bowels not open; wound inclined to open, edges flabby and pale.

15th.—Much better and in less pain. An abscess has formed in the inguinal canal and extended into the scrotum. Abscess opened by free incision.

17th.—Good night. Temp. normal; bowels acted twice yesterday. Wound still pale and showing no tendency to heal.

18th.—Bowels acted twice during the night; motions liquid, passed without patient's knowledge. He is weaker; cellulitis tends to spread from scrotum to surrounding parts.

19th.—Has become very drowsy and dusky; has some diarrhœa; takes nourishment (milk, eggs, brandy) freely.

21st.—He remained dusky and drowsy, subject to diarrhœa, and gradually losing strength, till he died at 3.30 this morning.

*Post-mortem* on December 23 disclosed extensive recent peritonitis, with copious effusion of purulent fluid. A portion about twelve inches long, at the lower part of the jejunum, was dark-coloured and softened, and displayed at either end the marks of tight constriction; above and below this portion the intestine was healthy. The lower part of great omentum lay chiefly in the left iliac region. It was thickened, scarred, and matted by old inflammatory adhesions, and presented several coarse, tough, adventitious bands stretching from point to point across its surface. The constriction divided during the operation could not be recognised with any certainty, but in one situation the omentum had the appearance of having been doubled upon itself and adherent, so as to form a narrow arch, the divided pillars of which could be faintly traced; and it was here, in all probability, that strangulation had taken place. The kidneys were large, pale, and fatty; heart normal; lungs emphysematous; at the base of the left was a hæmorrhagic infarct, with evidence of commencing pneumonia; other organs normal.

*Remarks.*—There are many departments of practice in which diagnosis has far outstripped treatment, but in the instance of intestinal obstruction it must be allowed that, difficult as treatment may be, the stumbling-block, in a large number of cases, lies in diagnosis. The subject is one which has of late attracted much attention, and some advance has been made. But we are as yet only on the threshold of the inquiry, and there can be no doubt that, as time goes on, and the question is critically studied, more and more of the obscurity by which these cases are en-

veloped is destined to be cleared away; that symptoms which have been thought lightly of, or even perhaps entirely overlooked, will prove to be main landmarks and turning-points in diagnosis; and that the recognition, on the one hand, of various combinations of symptoms, and, on the other, of various contrasts, will lead to an amount of precision which is at present entirely beyond our reach. To doubt that this will be the case seems inconsistent with what has lately been achieved, for instance, in the diagnosis of diseases of the heart and lungs, of the brain and other parts of the nervous system, and of the various special organs, such as the eye, the ear, and the larynx. But in order that progress may be made, it is essential that cases should be studied with the closest possible attention, especially in their early stages—for in their later phases accurate diagnosis will probably, in many examples, remain impossible; that even the most minute particulars of all completed cases should be fully recorded; and that the cases themselves, especially when mistakes have occurred, should be critically analysed and described.

As a contribution to this important and pressing subject, I hope the foregoing example is worthy of being placed on record. The case presented itself, in the first instance, as one of ordinary strangulated hernia. For some years the patient had often felt a small soft tumour in his left groin, but it had given him no trouble, and had always spontaneously disappeared. Such a tumour could be plainly felt, deeply seated in the upper end of the inguinal canal; it had become tense and firm, and appeared to be irreducible; and it was attended with all the usual symptoms of acute strangulation. When, however, in addition to this tumour, the swelling in the iliac fossa was detected, the nature of the case had to be reconsidered. The abdominal tumour was hard and very tender on pressure, and the patient referred all his pain to it. Had there been no tumour in the inguinal canal, such a swelling in the abdomen, coupled with the patient's symptoms, would have made it highly probable that the case was one of internal strangulation. What, however, was the construction that should be placed on the presence of these two swellings simultaneously? Was the patient suffering at the same moment with internal strangulation and with strangulated hernia? This was very unlikely indeed. But if this view were rejected, what alternative was there to fall back upon? It is easy to be wise after the event, and it is often impossible fully to recall all the original obscurities and uncertainties of a case when the light of a post-mortem examination has once been thrown upon it. But suppose in the examination of this particular instance the attention had first been

turned to the abdominal swelling and the symptoms with which it was attended. Here was a patient who some twenty hours before was seized with agonising abdominal pain and frequent and violent sickness, who was now in a condition of collapse, and in whose iliac fossa a tense and tender tumour, to which he referred all his sufferings, could be plainly felt. What could be more characteristic? Whatever else there might be, internal strangulation was evidently present. Arrived at this conclusion, it might next have been asked, whether it were possible that the tumour in the inguinal canal was, in spite of the features it presented, not a strangulated hernia? Now here was an example illustrating the necessity of using extreme caution, of keeping out of grooves, and of looking far enough afield in the diagnosis of the causes of intestinal obstruction. Every one has seen instances in which, when patients who have ascites have also a hernia, the fluid from the peritoneum drains down into the sac and distends it; and a similar condition is observed in congenital hydrocele in children. Would it have been difficult, in the present case, if the idea had once presented itself, to suspect that the sac, instead of containing intestine or omentum, was simply distended with fluid from the abdominal cavity? The main obstacle to this view would have been an impression of the improbability that any considerable amount of fluid had been poured out in the twenty-four hours that had elapsed since the patient's illness commenced. But such an impression would scarcely have been justified by clinical experience, for it is well known that effusion into the peritoneum sometimes takes place with great rapidity. Had the real condition of things in the sac been suspected, it would have been easy to arrive at the conclusion that the case was one of simple internal strangulation. I failed to get as far as this, yet I feel bound to admit that the materials for a correct diagnosis were not wanting; and I venture to record the story in the hope of showing that by careful and patient study and analysis of these cases, by looking at them from all available standpoints, and by a critical balancing of probabilities, the proportion of cases in which the truth is arrived at in the first instance, and before any false step in treatment has been taken, will steadily increase; and that at least the crowning vexation may be more and more frequently avoided of learning from a post-mortem inspection that a little closer examination, a little more carefully developed train of reasoning, might have disclosed the real state of things, and pointed to the means by which the patient's life could have been saved.

There was nothing calling for remark in the operation, unless it be the ease with which it was performed. The ring in the

omentum was immediately found, and divided with no more difficulty than must always attend the manipulation of important parts seated at the bottom of a deep and short incision.

All the symptoms of abdominal obstruction were immediately and permanently relieved. The passage of flatus per anum showed that the canal of the intestine was clear, and the bowels acted spontaneously and freely on the third day. There appeared for many days every prospect that the patient would recover. His death was, I believe, due to septicæmia, associated with a low and slowly advancing peritonitis. He was habitually extremely intemperate and his kidneys were fatty. Whether the peritonitis resulted from the injury to the intestine, or whether it depended on blood-poisoning, is doubtful; but the cellulitis of the scrotum which followed the exploration of the hernial sac served to show that the patient's general condition was unsound. Such diffuse inflammation may, however, have been due to the poisonous influence of the fluid that flooded the tissues as it ran from the cavity of the peritoneum.

The case ended in failure, and, of course, must be placed in the list of deaths after abdominal section for intestinal obstruction. Yet no argument against the operation can be drawn from its result. On the contrary, it belonged to a group which no means with which we are at present acquainted except abdominal section can ever be expected to relieve. Moreover, the effect of the operation was immediately to remove all the symptoms of strangulation.

## II.

### Cases of Strangulated Inguinal Hernia in Young Adults.

Case I.—*Congenital Hernia (right)—Strangulated four hours—Operation—Sac opened—Recovery.*

R. S., aged 24, a butcher, admitted, into Henry Ward, August 1, 1873. Patient had been the subject of hernia on the right side since boyhood. He had worn a truss, but this had lately been out of order. A fortnight previously the hernia had come down, and had been returned with difficulty. Four hours before admission, while he was coughing, it came down again, larger than he had ever seen it, and he was seized with agonising pain and frequent and violent sickness. On examination a scrotal hernia of the size of a small orange was found. It was globular, very firm and hard, tympanitic, and very tender. When the patient was under chloroform, taxis was tried, but the swelling was so

tense and the ring so small, that reduction could not be effected. I at once proceeded to operate. The sac proved to be formed by the tunica vaginalis, and the stricture was at its neck, opposite the internal inguinal ring. When the sac was opened, a piece of small intestine about four inches long, already turgid and livid with congestion, and distended like a tense bladder, rose into the wound. The neck of the sac, less than a third of an inch across, had a tight, thin cutting border. Some difficulty was found in returning the distended bowel, but it was gradually replaced when the air it contained had been emptied into the bowel within the abdomen.

August 2.—The patient had passed a good night. The wound looked well. All symptoms were relieved. Pulse, 86. Temp. 100°.

No details of the subsequent progress of the case need be given. The patient recovered very favourably, and was discharged on August 28.

CASE II.—*Congenital Hernia (right)—Strangulated eight hours—Operation—Sac opened—Recovery.*

G. M., aged 26, slaughterman, admitted on August 1, 1873 (a few hours after the case just recorded). His hernia first came down about a year before, when he was lifting a heavy weight of meat. He pushed it up with great difficulty. It had been down several times since, and for some months had not been completely reduced. He had never worn a truss. Symptoms of strangulation had set in eight hours before admission; he was violently sick, and in such severe suffering that he had been carried home. When brought to the Hospital, he was rolling about with pain, his pulse was rapid and small, he was frequently sick, and bathed in a cold sweat. On examination, a hernia was found as big as a large fist, very tense, tympanitic, and tender. As it could not be reduced by the taxis when the patient was under chloroform, operation was at once resorted to. The hernia was found to have passed into the funicular part of the tunica vaginalis. When the sac was opened, a large inflated bladder-like portion of intestine glided forward, and protruded at the wound. This was considerably larger than a cocoanut, deeply congested, and formed of coils of the small intestine matted together by old adhesions. Here, as in the former case, reduction was rendered very difficult by the small size of the ring, the inflated condition of the intestine, and the adhesion of its coils. During manipulation, some of the adhesions fortunately gave way, and the separated coils could then be returned.

August 2.—Patient had passed a rather restless night and complained of abdominal pains. Bowels had acted at five in the morning. No sickness since the operation. From this time all went on well, and the patient was discharged on September 2.

CASE III.—*Funicular Hernia (left) — Strangulated twenty-eight hours—Operation—Sac opened—Peritonitis—Formation of fæcal fistula on the eighth day—Recovery.*

J. P., aged 21, a pastrycook, admitted March 8, 1879. Four years before the patient had, he said, observed a swelling in the left side of the scrotum, but it gave him no trouble, and had not subsequently shown itself. He was quite well till the previous day at noontime, when "his testicle suddenly became swollen, and in such pain that he was obliged to go to bed." He was frequently sick and in an agony of abdominal pain all night. He was brought to the Hospital next day, and reported by his brother to have gonorrhœa and inflamed testicle. On examination, he was found lying on his left side with his knees drawn up to his chest; his face wore an expression of great anxiety and distress; his pulse was very small and the temperature of his surface low. He had free gonorrhœal discharge, and in the left half of the scrotum was a swelling as big as a small orange, covered with ruddy suffused integument, and, at first sight, looking very like an acute orchitis. It was, however, found that the abdomen was full, rounded, tympanitic, and very tender, and marked on its surface with distended coils of intestine, and that the swelling in the scrotum was also highly tympanitic. With these features, coupled with the patient's frequent and violent sickness, and his general condition, which was one bordering on collapse, there could be no doubt the case was one of strangulated hernia. When the patient was under chloroform taxis was carefully tried, but the hernia gave no sign of yielding. On cutting down on the swelling, I found all the tissues very congested. The stricture was at the neck of the sac. When the sac was opened, it was seen to be formed by the upper part of the tunica vaginalis. It contained about three drachms of turbid serum mixed with recently effused blood. The hernia consisted of omentum and small intestine. The omentum was very nearly black, and its meshes were loaded with extravasated blood. The intestine was deep puce coloured, greatly distended, and, when drawn down, was seen to be slightly ulcerated at the point of strangulation. It was returned into the abdomen. The omentum was then broken into small columns, tied, and cut off.

March 9.—Patient had drunk a little barley-water and

sucked some ice, and shortly after the operation had taken twenty drops of liquor opii sedativus. Pulse 108. Temp. 101.2°. Had been sick three times. No abdominal pain.

10th.—Abdomen much distended, painful, very tender; no respiratory movement. Had been sick in the morning. Bowels not open. Pulse 112. Temp. 102°. Ordered five drops of tincture of opium every four hours.

11th.—Bowels had acted twice early in the morning; no sickness; tongue dry; had vomited once. Pulse 108. Temp. 101.8°. To take ten drops of tincture of opium every four hours.

13th.—Sick twice in the morning; vomit distinctly fæcal. Abdomen still much distended. Pulse 120. Temp. 103°. He was now very ill, and his strength seemed to be failing.

14th.—Condition not much changed. Was sick occasionally.

15th.—Some fæcal matter was observed in the wound.

17th.—Two discharges of fæces occurred through the wound early in the morning. He was much better; abdomen much less distended. Pulse 98. Complained of hunger.

24th.—Had been doing well. Bowels acted regularly. Very slight discharge now occurred through the wound.

April 10th.—Wound had closed. He was discharged well on April 25, on his way to the Convalescent Hospital.

*Remarks.*—There exists in the museum of the Hospital an example of hernia into the tunica vaginalis, put up by Percival Pott, by whom this form of rupture was described accurately in a paper published in the year 1757. The ancient glass bottle, and the roll of paper by which the sac is distended, and which is of that peculiar ribbed manufacture and uncut edge which can now only be seen inscribed with the records of a century ago, unite to make this specimen one of the most interesting in the collection, and seem to give us a kind of personal introduction to the celebrated master of John Hunter, who, as it will be remembered, was apprenticed to Pott at St. Bartholomew's Hospital in 1751. The particular features, both anatomical and clinical, of this variety of hernia have been often and accurately described, but as the main purpose of "Hospital Reports" is to place on record cases that may illustrate important rules of practice, and keep them fresh in the memory, I hope I am not wrong in selecting the foregoing examples for publication. They are typical of their class. They were all in young adults (between the ages of twenty-one and twenty-six). In all, the hernia was of the variety that depends on the non-obliteration of the funicular portion of the peritoneum. In two cases the protrusion reached the bottom of the tunica vaginalis, so as to constitute the usual form of congenital hernia. In the third, the anatomical

relations were modified by the presence of an internal septum thrown across the peritoneal sac, opposite upper end of the testis, which shut off the tunica vaginalis from the funicular portion, and confined the protrusion to the upper of these two divisions, so that it formed that kind of congenital hernia to which the term "funicular" has been given. This difference, however, was unimportant from a clinical point of view, and left the cases for all practical purposes still in the same group. In all the symptoms from the first moment of strangulation were of the most urgent character; pain was intolerable, sickness frequent and violent, the pulse small and weak, and the temperature so depressed as to suggest a condition approaching to collapse, while in all the hernia was tense, hard, and tender; and although, owing to the severity of the symptoms, the patients were brought to the Hospital early, and were seen four hours, eight hours, and twenty-eight hours respectively after strangulation had set in, the attempt to reduce the hernia by taxis completely failed in all. The stricture was found in all to be at the neck of the sac, and to be so tight that the protruded parts showed signs of having been subjected to very severe strangulation. In the case in which the symptoms were of twenty-eight hours' duration, the patient very nearly died of peritonitis, and the intestine was so severely damaged that on the eighth day it burst, and a fæcal fistula was the result. It is thus seen that these examples amply bear out the reputation which strangulated congenital hernia in young adults has gained of being dangerous beyond, perhaps, any other form that can be mentioned. The opening into the funicular portion of the peritoneum is usually very small, and strangulation is from the first so tight that it is but a very few hours before serious injury to the intestine will take place.

In bringing to mind instances of the most detrimental forms of practice that are at present in vogue—though this might not be ventured upon without considerable hesitation—it would be nearly safe to point to the examples that are every now and then seen, though every year more rarely, of the use of the catheter in retention due to enlarged prostate. But probably the palm ought in strict justice to be awarded to the manner in which operation is sometimes postponed and taxis persevered with in cases of strangulated hernia. National peculiarities are prone to show themselves in season and out of season, and the feeling, so long and so deeply rooted among us, that it is unpleasant to be beaten, will sometimes inopportunely assert itself in the surgeon as well as in the soldier and the colonist; and it must be owned that at least once or twice a year cases are brought to the

Hospital in which this tenacity of purpose has been carried too far. Patients are admitted whose hernia has been strangulated for three or four days, and who, in addition to the liberal use of medicines which are usually purgatives, but which, when given in intestinal obstruction, act as certain and very powerful emetics, have been treated by taxis repeated twice or three times a day with gradually increasing force and determination. It is much to be regretted that such a practice should still be followed. How futile as well as dangerous it must always be is plainly shown once more by the cases under review, though the fact has been already so frequently insisted upon that it will scarcely bear repetition without apology. When the sac was opened, it was found that, as the intestine was inflated like a bladder and surrounded at its neck by what was virtually a tight ligature, the reduction of the hernia by taxis was a simple mechanical impossibility: the attempt, if persevered in, would have been the most certain means that could be chosen of adding to the damage the intestine had already suffered.

It seems desirable to trace the severity of the symptoms in this set of cases to its source. It depends no doubt in part on the small size of the neck of the sac ; but to a great extent it is owing to the fact that the patients are young adults whose muscular system, in both its voluntary and its organic parts, is endowed with its highest degree of irritability and power. The best contrast to these cases is found in children, in whom all the structures concerned in hernia are lax and ready to yield, and the muscles are comparatively feeble. In children, especially in the more weakly, hernia often attains a considerable size, but it very seldom becomes strangulated. In elderly persons, for the same reason, large inguinal herniæ are often found in which strangulation is very unlikely to occur, and in which, even though it has occurred, reduction by taxis can usually be accomplished. But in young adults the descent of a loop of intestine through a narrow ring, by which it is tightly constricted, is followed by reflex irritation inducing intense muscular contraction. Vermicular movement forces more intestine down, and as each portion descends, the muscular fibre of its wall becomes paralysed by the constriction to which it is subjected as it passes the tight ring; just as the muscular coat of the small vessels of a limb suffers a transient paralysis by the application of an Esmarch's bandage. This paralysis leads to (1) engorgement and (2) inflation, and these in their turn, by distending the sac, both tighten and sharpen the borders of its ring. Increased vermicular movement of the adjacent portions of intestine is accompanied with forcible contraction of the

muscles of the abdominal wall, and the patient suffers intensely with griping pains, urgent and frequent sickness, and all the other symptoms of severe strangulation.

It is hardly necessary to observe, that, as the severe mechanical injury to which the intestine is exposed in this form of hernia is due chiefly to the age and muscular power and irritability of the patients in whom it occurs, it is by no means limited to this particular variety, but is likely to be met with in any strangulated hernia occurring in young adults.

# ANATOMICAL VARIATIONS:

AN ACCOUNT OF A FEW OF

## THE MORE INTERESTING ABNORMALITIES

THAT HAVE OCCURRED IN THE DISSECTING-ROOMS
DURING THE LAST SEVEN YEARS;

## WITH REMARKS ON THEIR MORPHOLOGICAL SIGNIFICANCE,

AND THEIR

## BEARING ON THE PRACTICE OF SURGERY.

BY

W. J. WALSHAM.

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Believing that a report of the anatomical variations that have occurred in the dissecting-rooms would be an acceptable communication to the Hospital Reports, I have selected the following from among the very numerous abnormalities that have come under my observation during the last seven years. They have been chosen either on account of their rarity, or because they seemed of morphological interest, or of some slight practical value to the surgeon. They are described from notes taken at the time. The drawings on wood were kindly made for me by Mr. Godart, from rough sketches in my note-book of the dissected parts.

No attempt is here made to furnish a statistical report of the relative frequency of the more common and everyday observed abnormalities. I hope, however, to have an opportunity of publishing such an account on some future occasion.

MUSCLES.

*The right Sterno-Thyroid arising from the left as well as from the right side of the Sternum, and crossing the front of the Trachea; the left Sterno-Thyroid rudimentary.*

The right sterno-thyroid, in addition to its normal origin on the right side, also arose from the back of the first bone of the sternum for three-quarters of an inch to the left of the middle line, *i.e.*, it arose from the part usually occupied by the innermost fibres of origin of the left sterno-thyroid. It measured, just

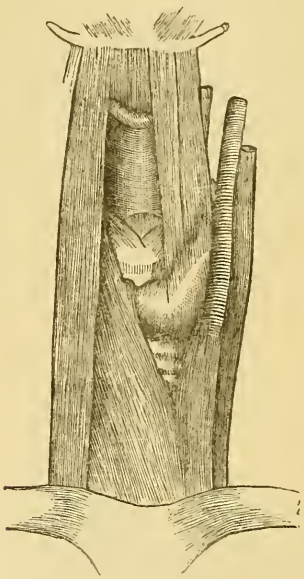

Fig. 1.

above the sternum, one and three-eighths of an inch in width. From this origin it ran obliquely across the middle line of the neck, leaving only the upper half-inch of the trachea uncovered by its fibres. It was inserted into the oblique line on the ala of the thyroid cartilage in the normal manner. A little above the sternum, at the spot where the transverse tendinous intersection is often observed, the muscle rather suddenly became narrower. No very distinct cellular interval could be traced between the part of the muscle arising from the right and the part arising from the left of the sternum.

The left sterno-thyroid was only represented at its origin and

insertion. Its middle third was quite suppressed. Its lowermost portion consisted of a few fibres, forming a thin muscle, about an inch and a half in length, and arose from the back of the sternum just external to the abnormal origin of the right muscle, and ended on the carotid sheath. Its uppermost portion, about a quarter of an inch in breadth and an inch and a half in length, was attached to the oblique line on the ala of the thyroid cartilage, and was inserted into the left lobe of the thyroid body on its antero-internal aspect. A levator glandulæ thyroideæ, arising from the body of the hyoid bone and inserted into the isthmus of the thyroid gland, was also present.

This is the only abnormality of the kind that I have seen. Macalister relates a case in which the sterno-thyroid was absent, and this Professor Humphry[1] states to be the only example of the absence of the sterno-thyroid or sterno-hyoid that he has seen recorded. A slip from the outer edge of the sterno-thyroid has been noticed, extending to the sheath of the vessels; but I know of no case in which the sterno-thyroid has been seen crossing the middle line of the neck, and in which the middle of the muscle has been suppressed. In the great ant eater the sterno-thyroids decussate across the middle line, but this decussation takes place behind the sternum, the sterno-thyroid in this animal arising in the interior of the thorax as far back as the eighth bone of the sternum (Owen); and it is noteworthy that at the place of decussation a tendinous intersection exists.

The rudimentary condition of the left sterno-thyroid is of considerable importance. In the sterno-thyroid as well as in the sterno-hyoid, a transverse tendinous intersection is often observed just above the sternum, "a remnant," says Professor Humphry,[2] "of the transverse septa of the primitive ventral muscle." Occasionally a similar but less marked intersection is seen a little higher in these muscles; whilst, as is well known, in animals with long necks, as the giraffe, the depressors of the hyoid consist of alternate tendinous and muscular portions. These tendinous intersections, which are serially homologous with the transverse inscriptions in the rectus abdominis and the rectus sternalis, when present, would thus seem to indicate that the muscle was developed from a number of distinct vertebral segments.

The explanation of the abnormality (absence of the middle portion of the left sterno-thyroid) would seem to be, that one or more of the primitive segments from which the middle part of the muscle is developed, *i.e.*, the part between two or more trans-

[1] Brit. Med. Journal, 1873, vol. i.

[2] Ibid., 1873, vol. i.

verse intersections, was non-differentiated or suppressed, or in part blended with the primitive muscular segment of the opposite side; whilst the segments above and below, *i.e.*, the portions of the muscle respectively above and below the upper and lower transverse intersections, were only to a lesser degree affected, and consequently remained in a rudimentary condition, and in the case of the lower segment, partly blended with the opposite muscle.

The knowledge of such an abnormality is not altogether without practical value; for the presence of this muscle crossing obliquely the trachea would undoubtedly be a source of embarrassment in the performance of tracheotomy below the isthmus. The whole of the trachea except the upper half-inch was completely covered by the muscle, which would have had to be divided to expose the tube, as the muscle could hardly, in this situation, have been drawn to one side.

### *Absence of the Anterior Belly of the Omo-Hyoid.*

The anterior belly of the omo-hyoid in this body was completely wanting on the right side; on the opposite side, though present, it was smaller than usual. The posterior belly arose in the fascia over the supra-spinatus. It measured about two inches in length and a quarter of an inch in breadth; passed obliquely across the posterior triangle, and terminated under the sterno-mastoid in the cervical fascia, through a thickened band of which it was attached to the body of the hyoid bone. Similar abnormalities have been noticed by R. Quain, Hallett,[1] and others.

In the body in which this abnormality occurred the sterno-hyoid did not appear broader than natural; but this muscle was considerably broader in another body in which the anterior belly was apparently absent. The abnormal breadth of the one and the apparent absence of the other was clearly due to the blending together of the two muscles, or rather to the non-differentiation of the primitive brachio-cephalic sheet from which they are developed. Professor Turner[2] has noticed a similar condition in four cases, in all of which the inscription in the sterno-hyoid was continued into the omo-hyoid. In two of Hallett's cases of absence of the anterior belly of the omo-hyoid, the sterno-hyoid was broader than usual, and attached to the clavicle behind the sterno-mastoid—the normal origin of the omo-hyoid in some animals (menobranchus). The absence of the anterior belly is productive of considerable alteration in the

[1] Edinburgh Medical Journal, 1848, vol. ii.
[2] Edinburgh Medical and Surgical Journal, 1861.

carotid triangles, inasmuch as they would then be merged into one, and the important surgical landmark, viz., the inferior angle of the superior triangle formed opposite the cricoid cartilage by the meeting of the omo-hyoid with the sterno-mastoid, would not be present. The inferior angle of the, in this case, single triangle would be formed by the meeting of the sterno-mastoid with the sterno-hyoid at a spot considerably lower in the neck than that usually occupied by the inferior angle of the superior triangle. The inferior carotid triangle would, under these circumstances, no longer exist. This is, however, not of much practical importance, since the sterno-hyoid and sterno-thyroid are by many divided in tying the carotid at the root of the neck.

*Absence of the Intermediate Tendon of the Omo-Hyoid.*

The posterior belly arose naturally, passed across the posterior triangle more obliquely than usual, and was continued into the anterior belly—a tendinous intersection, but no distinct tendon,

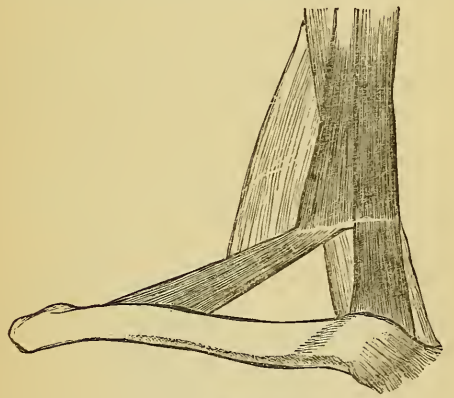

Fig. 2.

intervening. The tendinous intersection was most marked on the outer side of the muscle and on its posterior aspect, where the tendinous fibres measured nearly half an inch in length. It was on the same level, and appeared continuous through a slight thickening of the fascia with the tendinous intersection in the sterno-hyoid. At a nearly corresponding spot in the sterno-thyroid a similar transverse intersection existed. It is interesting to note that the tendinous intersections in each of the three muscles were in the same transverse plane—an evidence that the

intersections were the remains of the same transverse septa of the primitive ventral muscle-plate, and consequently that the muscle above and below was developed from two separate vertebral segments. As the intersection in the omo-hyoid was clearly the representative of the ordinary intermediate tendon, a clue is afforded by this abnormality to the significance of two bellies in these two-bellied muscles.

In the quadrumana, with the exception of the higher tailless apes, the intermediate tendon in the omo-hyoid does not normally exist.

*The Posterior Belly of the Omo-Hyoid attached to the Middle of the Clavicle.*

This is a very common abnormality. According to my statistics, it occurs once in every twenty bodies; a statement, however, that must be taken with reserve, as in a few instances the condition may have been overlooked. The muscle has generally been attached for about two inches to the middle third of the posterior border of the clavicle, but I have sometimes noticed it extending for more than three inches along that border. Examples of a clavicular origin of the omo-hyoid are recorded by Mr. Wood[1] and in the Guy's[2] and St. Thomas' Hospital Reports,[3] but it does not seem to have occurred so frequently at these Hospitals as at St. Bartholomew's. In Quain[4] it is stated that when the muscle is attached to the clavicle instead of to the scapula, the posterior belly is absent. This has certainly not been my experience. When there has been no intermediate tendon, I have almost invariably found a tendinous intersection similarly placed to that in the case given above.

A clavicular attachment is the normal arrangement of the omo-hyoid in some animals, *i.e.*, the iguana. Where the muscle arises from the clavicle, a supra-clavicular or subclavian triangle no longer exists: the muscle then completely covers the third portion of the subclavian artery, and might cause some embarrassment in tying the vessel in this part of its course. I have seen a student in the operative surgery class not a little puzzled on meeting with a like arrangement.

*The Omo-Hyoid arising from the Sternal End of the Clavicle.*

The omo-hyoid arose by fleshy fibres from the sternal end of the clavicle. There was a slight trace of a tendinous intersection opposite that in the sterno-hyoid. Its insertion was normal.

[1] Proceedings of Royal Society, 1868.
[2] Guy's Hospital Reports, vol. xiv.
[3] St. Thomas' Hospital Reports, vol. vi.
[4] Quain's Anatomy, eighth edition.

Professor Humphry[1] mentions such an attachment of the omo-hyoid as of rare occurrence, but does not give the reference where the abnormality is recorded. The attachment is of much morphological interest, because the sternal end of the clavicle is generally regarded by anatomists as the homologue of the precoracoid; and the omo-hyoid in the batrachians, *e.g.*, the efts, arises from the precoracoid.

*The Posterior Belly of the Omo-Hyoid doubled.*

In this case one belly arose in the normal manner from the scapula, the other from the clavicle. Both bellies terminated in the common tendon. There was a single anterior belly. Somewhat similar instances are given in the Guy's Hospital Reports;[2] in one, "the omo-hyoid having its normal relations, an additional muscle arose from the clavicle near the sternum, and ran up to join the sterno-thyroid before its insertion;" in another, a similar slip arose from the first rib. Mr. Wood[3] has recorded a case of a double omo-hyoid, the upper one digastric, the lower interrupted by tendon, and attached to the base of the coracoid process.[4]

*Tendinous Intersection in the Posterior Belly of the Digastricus.*

The tendinous intersection was situated about half an inch

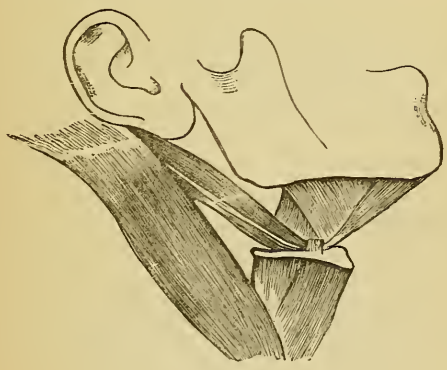

Fig. 3.

from the normal tendon. It involved the whole of the fibres,

[1] Observations on Myology, Brit. Med. Jour., vol. ii. 1873.
[2] Vol. xiv. p. 438.
[3] Proceedings of Royal Society, 1867.
[4] Since this was written I have seen two examples similar to the first mentioned in the Guy's Reports, and one like that of Mr. Wood's.

and extended through the muscle downwards and forwards obliquely to the long axis of the muscle, but transversely to the long axis of the neck. This abnormality appears to be a minor grade of the following:—

*A distinct Tendon in the Posterior Belly of the Digastricus.*

The posterior belly of the digastricus was divided into two distinct muscles by a tendon half an inch long, situated about

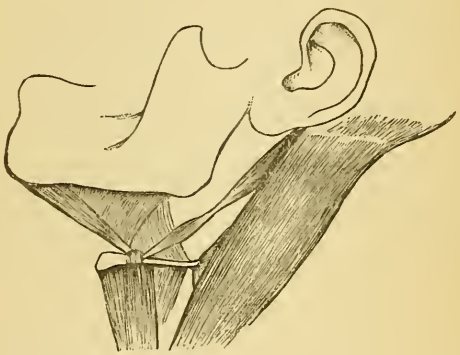

Fig. 4.

half an inch from the normal tendon. On the opposite side of the neck the digastricus presented a tendinous intersection similar to that in the preceding case.

These abnormalities appear to be rare. They are the only cases I have seen during my connection with the dissecting-rooms, nor have I found the abnormality mentioned elsewhere.

The anterior belly of this muscle is very frequently abnormal, but my experience agrees with Professor Humphry's that the "hinder belly varies little or seldom." I have many times seen the anterior belly double and decussating across the median line —the normal arrangement, as pointed out by Mr. Wood, in the Norway rat, and to a lesser degree in ruminants. Three bellies have been observed by Hallett, about once, he says, in every fifteen subjects, "The third belly commenced by a short flattened tendon at the anterior part of the reflection between the two normal bellies; a branch of the mylo-hyoidean nerve could be traced into the third belly."[1] These were evidently examples of a double anterior belly. Neither the anterior nor the posterior

[1] Loc. cit., p. 2.

belly has been observed absent—an experience, as far as the anterior belly is concerned, in accordance with that of Professor Humphry, who remarks that "variations in the anterior belly are on the side of excess rather than of deficiency."

In birds and reptiles, the muscle that is supposed by many to be the homologue of the digastricus in man has only one belly, and descends from the hinder part of the cranium to the posterior end of the mandible; but in some birds it is divided into three portions (Mivart). The three portions of muscle in the abnormality under consideration is suggestive of a reversion to the aval type. In the carnivora, moreover, the "digastricus," although apparently single bellied, has many tendinous filaments in the middle of the muscle substance.

Professor Humphry[1] is of opinion that the hinder belly of the digastricus and the stylo-hyoid are developed from the deeper stratum of the brachio-cephalic extension which reaches forwards from the sternum to the skull. "These two muscles," he says, "are evidently two segments of an anterior part of that muscle, and they are marked off from the post-hyoidean portion (sterno-hyoid) of the stratum by the hyoid bone and the other remnants of the transverse intermuscular hyoidean septum; just as the anterior belly of the digastricus is a segment of the superficial stratum, and terminates posteriorly in the same septum, which thus forms the uniting tendon between the two bellies." The tendinous intersection or distinct tendon in the posterior belly of the digastricus appears to me also to be a remnant of a primitive transverse septum, and consequently to point to the development of the posterior belly of the digastricus from two distinct vertebral segments. This view seems borne out by the following muscular variation:—

*A thin Slip of Muscle arising from the Digastric Fossa of the Temporal Bone and inserted into the Hyoid Bone near the Lesser Cornu.*

This very interesting abnormality occurred in the same body as that in which the tendon was observed in the posterior belly of the digastricus (see fig. 3), but on the opposite side; that is, on the side on which the posterior belly presented merely a tendinous intersection. The slip in question ran parallel to, and a little below and to the other side of, the posterior belly of the digastricus. It arose from the digastric fossa and terminated in a small slim tendon, by which it was inserted into the body of

[1] Loc. cit., vol. i. 1873, p. 695.

the hyoid bone near the lesser cornu. The fleshy fibres measured about two inches in length and about an eighth of an inch in thickness, and were divided into an upper and lower portion by a delicate tendon. This tendon was in the same transverse plane as the tendinous intersection in the posterior belly of the digastricus, and must evidently have had its origin in the same way as the intersection in the digastricus. I know of no similar condition having been observed.

*Variations in the Stylo-Hyoid.*

A second stylo-hyoid arose from the base of the styloid process and accompanied the stylo-hyoid ligament to the hyoid bone. The normal stylo-hyoid did not embrace the digastricus. Two similar cases were noticed at Guy's Hospital.[1] The variation has also been seen by Lawson Tait[2] and others. In an instance mentioned by Mr. Wood in which the muscle was double, one part was attached to the posterior belly of the digastricus, the other to the anterior belly.[3]

The stylo-hyoid has occasionally been absent or blended with the digastricus, and marked variations in the size of the muscle have frequently been observed; but one of the most interesting varieties is that first described by Mr. Wood, in which the muscle was continuous with the omo-hyoid, thus approaching the form that it takes in the great ant eater. The muscle has also been observed proceeding from the styloid process along the stylo-maxillary ligament to the angle of the jaw, the normal attachment in some birds, *e.g.*, the fieldfare (Mivart).

Mr. Perrin,[4] however, has pointed out the resemblance which the stylo-hyoid in birds bears to the muscular slips (occipito-hyoids) described by him in the "Journal of Anatomy and Physiology." The stylo-hyoid, however, was normal in two of the bodies in which these muscular slips were observed, although it was absent in a third.

Dr. Shepherd records an interesting specimen in which the muscle ran beneath the external carotid artery, but, as he says himself, this might more properly be regarded as an abnormality in the course of the artery. It is one not so very uncommon.[5]

*Presence of a Mylo-Glossus.*

The muscle arose from the angle of the lower jaw and the

[1] Guy's Hospital Reports, vol. xvi.
[2] Journal of Anatomy and Physiology, May 1870.
[3] Proceedings of the Royal Society, 1868.
[4] Journal of Anatomy and Physiology, vol. v.
[5] Montreal General Hospital Reports, vol. i. 1880.

stylo-maxillary ligament, and was inserted into the side of the tongue, blending with the fibres of the stylo-glossus.

This muscle was first described by Mr. John Wood.[1] In his case, however, the muscle was not attached to the stylo-maxillary ligament.

### *A Double Stylo-Pharyngeus.*

The second portion of the muscle was represented by a thin slip passing from the styloid process along the lower border of the normal muscle to the walls of the pharynx. The glosso-pharyngeal nerve passed between the two portions of the muscle. A second stylo-pharyngeus is recorded in the "Guy's Hospital Reports," vol. xviii., passing behind the middle constrictor of the pharynx. A similar case has been observed by Mr. Wood.

### *The Middle Portion of the Hyo-Glossus absent.*

Several examples of this variation have been observed. The portion of the muscle absent was that which arises from the

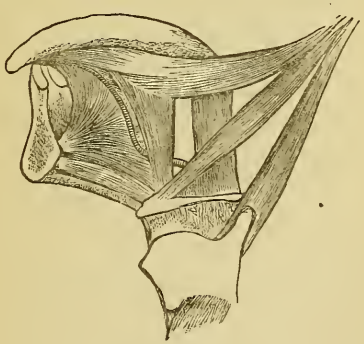

Fig. 5.

lesser cornu, so that an interval was left between the portions arising from the body and from the greater cornu. The fact that each part of the muscle constitutes a separate muscle in some of the lower animals, offers a ready explanation of the deficiency. On account of its frequency this abnormality is perhaps not altogether devoid of practical importance, as when it occurs the lingual artery, where it lies in the triangle formed by the two bellies of the digastricus and the hypo-glossal nerve, is then uncovered by muscle ; a point worth remembering should one be

[1] Proceedings of the Royal Society, 1868.

called upon to perform what may be called the dissecting-room operation of tying the lingual where it lies between the hyo-glossus and the middle constrictor of the pharynx.

### *Presence of a Triticeo-Glossus.*

The triticeo-glossus has been frequently observed arising from the cartilago-triticea, a small nodule of cartilage generally but not always present in the posterior thyro-hyoid ligament. The muscle has been noticed even when no trace of the cartilage could be found. Under these circumstances the muscle is either attached to the thyro-hyoid ligament or to the top of the superior cornu of the thyroid cartilage.

### *The Subclavius inserted into the Coracoid Process as well as into the Clavicle.*

The subclavius, in addition to its attachment to the clavicle, was inserted by a slip derived from its posterior part into the coracoid process at the attachment of the conoid ligament. A few fibres were attached to that ligament. Similar examples are mentioned in the "Guy's Hospital Reports"[1] and by Mr. Wood.[2]

That part of the subclavius muscle which ran from the clavicle to the base of the coracoid process appears to be similar to that described by Mr. Wood as the scapulo-clavicular muscle, which he points out is clearly the homologue of the scapulo-clavien of Cuvier and Laurillard, described and figured by them as occurring in the rat-mole of the Cape and didelphys marsupialis, and which Mr. Wood has also found well marked and distinct in the Norway rat, the guinea-pig, and, in a less distinct form, in the rabbit.

In Mr. Wood's case, the slip, which measured nearly an inch in width, arose from the base of the coracoid process, and was inserted into the clavicle with the outermost fibres of the subclavius muscle. A slip of muscle, likewise noted by the same author, has been seen arising from the cartilage of the first rib and inserted into the base of the coracoid, but not attached to the clavicle in any part of its course. This slip reminds us of the arrangement in the monotremata, in which the normal attachment of the subclavius is into the coracoid (Owen). The coracoid in these animals, however, is not a subordinate process of the scapula.

In a second case of double subclavius muscle observed at St. Bartholomew's Hospital, a bursa existed between the tendon in which the muscle ended and the coracoid process, and an expan-

[1] Vols. xiv. and xviii.

[2] Proceedings of Royal Society, June 16, 1864.

sion could be traced from this tendon to the humerus. In birds the subclavius arises under the pectoralis and its tendon passes between the clavicle, the coracoid, and the scapula, to be inserted into the humerus (Mivart). The bursa over the coracoid and the expansion to the humerus reminds us of the arrangement of the subclavius in birds.

By Professor Humphry, however, the pectoralis minor is regarded as the homologue of the subclavius or levator humeri of birds; but the pectoralis minor, as pointed out by this author, is continuous with the subclavius in some animals, as the two-toed anteater, though separated from it in man by the costo-clavicular fascia.

In connection with these abnormalities of the subclavius may be mentioned the following interesting variations, of which three examples have been observed :—

*The Pectoralis Minor inserted into the Humerus.*

The muscle ended in a tendon which passed over the coracoid process, a bursa intervening between it and the bone, and was inserted into the capsule of the shoulder-joint, and through it into the greater tuberosity of the humerus.

This is the normal arrangement in some of the quadrumana, and resembles, as above stated, the method of insertion of the subclavius or levator humeri of birds, with which it is by many regarded as the homologue. Professor Mivart, however, is of opinion that the pectoralis minor in birds is blended with the pectoralis major.

*The Anterior Fibres of the Trapezius extending across the lower part of the Posterior Triangle in the form of an arch.*

The trapezius had its normal origin. The anterior fibres extended over the greater part of the lower half of the posterior triangle to within two inches of the sternal end of the clavicle. The most anterior of these fibres terminated directly on the posterior border of the clavicle under cover of the sterno-mastoid, the insertion measuring about half an inch. The next set of fibres terminated on a tendon which stretched in the form of an arch, with the concavity towards the clavicle, from the acromion, just external to the clavicular articulation, to the clavicle external to the insertion of the most anterior fibres of the slip. About an inch from the clavicle this tendon spread out into an aponeurosis, which became attached to half an inch of the posterior border of that bone.

In two somewhat similar cases the anterior fibres with the arched tendon did not quite reach the sterno-mastoid, but were inserted into a prominent tubercle on the posterior border of the

Fig. 6.

clavicle just external to that muscle. In these instances the external jugular vein passed between the tendon and the clavicle. In all the cases the slip from the trapezius was situated immediately in front of the third part of the subclavian artery, an interval of less than a quarter of an inch only existing between the tendon and the clavicle.

Similar abnormalities of this muscle are described by Wood,[1] Macwhinnie,[2] Grüber,[3] Hallet,[4] Macalister,[5] and by the demonstrators of Guy's Hospital in their Reports.[6]

The comparative frequency of its occurrence forbids us from leaving it altogether out of consideration in the operation of tying the subclavian artery in the third part of its course.

By Mr. Wood this variation is believed to be due to a blend-

[1] Proceedings of Royal Society, 1866 and 1867.
[2] London Medical Gazette, 1846, p. 194.
[3] Vier Abhandlungen, 1847, S. 16.
[4] Edinburgh Medical and Surgical Journal, 1848.
[5] Proceedings of Royal Irish Academy, 1866.
[6] Guy's Hospital Reports, vol. xiv.

ing or fusion of the cleido-occipital or cephalo-humeral with the cervical border of the trapezius. It may be regarded as homologous with the masto-humeralis of the claviculate ungulates, the deeper portion of which is inserted as far forward as the sternum. The masto-humeralis, however, is looked upon by Professor Owen as the homologue merely of the cleidal portion of the trapezius.

*The Trapezius consisting of two separate muscular portions.*

The aponeurosis between the upper and lower fibres of the trapezius extended to the scapula, dividing the muscle into two distinct parts. This is the normal condition of the muscle in some animals. Thus, in the monotremata[1] the anterior or upper part arises from the occipital bone and tendinous raphé connecting it with its fellow of the opposite side, and is inserted in the outer half of the spine of the scapula; whilst the posterior or lower part, triangular in shape, arises from the tenth and eleventh dorsal vertebræ, and is inserted by a strong tendon behind the extremity of the spine of the scapula. In the quagga and mule it also normally consists of two portions, whilst in the horse and ox only the scapular part of the muscle of man is represented.

*A Muscular Slip extending from the Sternal End of the Clavicle to the Transverse Process of the Atlas.*

The slip measured about a half an inch in width. It arose from the posterior border of the clavicle, just external to the origin of the sterno-mastoid, and crossing superficially to the omo-hyoid and the posterior triangle of the neck, was inserted into the transverse process of the atlas in front of the attachment of the first slip of the levator anguli scapulæ. I am not aware that this variation has been elsewhere described.

*A Slip extending from the Mastoid Process to the Carotid Sheath opposite the Thyroid Cartilage.*

This slip, which was about a quarter of an inch in width, arose by a tendon about an inch and a half long from the apex of the mastoid process of the temporal bone, and stretching along and under cover of the anterior margin of the sterno-mastoid muscle, was inserted aponeurotically into the carotid sheath opposite the lower margin of the thyroid cartilage.

[1] Owen's Anatomy of Vertebrates, vol. iii. p. 3, 1868.

*Muscular Slips from the Latissimus Dorsi crossing the Axilla.*

Slips and expansions from the axillary border of the latissimus dorsi have been very frequently observed. They were attached as follows:—

To the pectoralis major, the pectoralis minor, the coracobrachialis, the teres major, the coracoid process, the axillary fascia, and the fascia of the arm. The embarrassment to which they might give rise in tying the axillary artery in the third part of its course is obvious. Each of these attachments is the normal arrangement of the muscle in some one of the lower animals. Thus in the monotremata the latissimus dorsi is inserted into the fascia of the arm and forearm, as well as into the humerus. In perameles it is connected by a slip to the teres major, and in the lepidosiren it is connected to the pectoralis major, &c.

*Presence of a Flexor Indicis.*

The muscle abnormally present consisted of a fleshy slip about the size of the extensor indicis. It arose from the anterior surface of the interosseous membrane immediately above the pronator quadratus, and was separated from the flexor profundus by a distinct cellular interval. It was inserted into the base of the third phalanx of the index-finger. A distinct flexor indicis is the normal condition in the orang-outang, gorilla, and chimpanzee.

In a second case a slip of muscle, of about the same dimensions as the above described, arose from two or three inches of the interosseous membrane, just above the pronator quadratus, and from the contiguous anterior surface of the radius internal to the flexor longus pollicis. It ran under the annular ligament, between the flexor sublimis and flexor profundus digitorum, and was inserted into the deep flexor tendon of the index-finger, opposite the middle of the metacarpal bone. In two similar abnormalities observed by Mr. Wood, the flexor pollicis divided into two, but the inner and smaller portion joined the indicial tendon of the flexor profundus about the wrist; and in another case it was inserted directly into the ungual phalanx. This author has also seen a slip of muscle which may be compared to the communicating tendon between the flexor longus pollicis and the flexor longus digitorum of the foot, passing in the opposite direction, *i.e.*, from the flexor digitorum to the flexor pollicis, a variation which I have observed occasionally in the human foot, and which is normal in the gorilla and chimpanzee.[1]

[1] Wilder, Boston Journal of Natural History, vol. vii. p. 364.

*The Flexor Profundus Digitorum inseparably united with the Flexor Longus Pollicis.*

There was no cellular interval between these muscles. The anterior interosseous artery was completely covered by the fibres of the united muscles arising over it from the interosseous membrane. The muscle split primarily into two tendons—the outer one was inserted into the thumb as the flexor pollicis, the inner divided into four tendons for the fingers. Non-differentiation of the deep muscle on the flexor aspect of the arm into the flexor pollicis and digitorum is a common condition in the lower animals, as, *e.g.*, in echidna and dasypus. Slighter grades of union of the flexor profundus and flexor longus pollicis by slips, both muscular and tendinous, passing in various ways from the one to the other, as might be expected from the many varieties of this muscle present in animals, have been very frequently observed, and somewhat similar slips have been recorded by others.

*A Slip from the Pronator Quadratus to the Scaphoid Bone.*

The slip ran obliquely downwards and outwards through a slight groove in the lower end of the radius, and was inserted

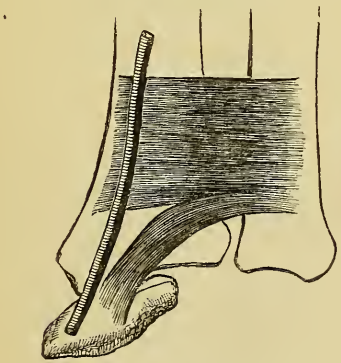

Fig. 7.

into the tubercle of the scaphoid. It measured two and a half inches in length and a quarter of an inch in breadth. It was fleshy both at its origin and insertion. The tendon of the flexor longus pollicis crossed it, and the radial artery was to its outer side. A similar slip prolonged from the muscle to the radial

side of the carpus has been observed by Macalister,[1] and one prolonged to the carpus on the ulnar side by Grüber.[2]

*The Extensor Indicis arising from the Dorsum of the Wrist.*

The muscle was about the size of a lumbricalis. It arose from the dorsal ligament of the wrist at the bottom of the groove common to the tendons of the extensor communis digitorum and extensor indicis, and ended on a tendon which joined the extensor communis on the metacarpal phalanx in the usual manner. A similar slip arising from the dorsal ligament of the carpus, and inserted by two tendons, one joining the common extensor tendon of the index-finger, the other that of the middle finger, has been twice observed at Guy's Hospital.[3]

An extensor proprius digiti medii has been observed by Wood,[4] and by the demonstrators of St. Thomas' Hospital,[5] arising from the lower end of the back of the ulna and interosseous ligament, distinct from the indicator muscle, and inserted into the dorsal expansion of the common extensor tendon.

The extensor indicis in the lemuridæ gives tendons to the third, fourth, and fifth digits as well as the index. In the dog and rabbit the extensor indicis coalesces with the extensor secundi internodii pollicis.

The origin of the extensor indicis from the dorsum of the wrist, especially when its attachments can be traced to the cuneiform bone, which is the homologue of part of the os calcis in the foot, is of interest as further pointing to the homology of this muscle to part of the extensor brevis digitorum pedis. It would at first appear as if there was no muscle in the upper extremity homologous to the extensor brevis digitorum in the lower. The indicator, the extensor primi internodii pollicis, and the extensor minimi digiti, however, may be together taken as representing it; but with this difference, that the parts composing it have undergone further differentiation and modification to meet the higher functional development of the hand; and have, moreover, for better leverage, become attached to the bones of the arm instead of to the carpus. The occasional attachment of the indicator to the bones of the carpus and the presence of an extensor medii digiti seems to lend support to this view, which, if correct, would allow us to regard the attachment of

[1] Jour. Anat, Physiol., vol. v.
[2] Grüber, Mém. St. Petersburg Academy.
[3] Reports, vol. xvi. p. 152; vol. xiv. p. 442.
[4] Proceedings of Royal Society, 1865.
[5] St. Thomas' Hospital Reports, vol. vi.

the indicator to the carpus as a reversion to a lower grade of development.

### *A Third Head to the Gastrocnemius.*

The outer and inner heads of the gastrocnemius were attached in a normal manner to the femur; a third head, about the size of the plantaris (3 inches in length and ½ an inch in width),

Fig. 8.

was situated internal to the inner head, and was quite distinct from it. It arose from the back of the internal condyle, 1½ inch above the inter-condyloid notch, internal to the axis of the femur. The fleshy fibres ended on a rounded tendon one inch above the point of convergence of the outer and inner heads of the gastrocnemius, and could be traced, after meeting the two heads, as a flattened tendon, to the middle of the gastrocnemius.

The accessory head was quite distinct from the plantaris, and about one inch from it. The popliteal artery ran between it and the internal head. This abnormality has only once been observed by the demonstrators of Guy's.[1] A third head has been observed by R. Quain[2] to pass between the popliteal artery

[1] Guy's Hospital Reports, vol. xvi.
[2] R. Quain, plate 80, figs. 4 and 5.

and vein. In "St. Thomas Hospital Reports"[1] a similar muscle has been described, arising from the inner condyle, and enclosing the popliteal artery and vein in a kind of muscular tube, and blending with the outer head of the gastrocnemius.

Mr. Wood[2] met with a similar slip arising by two heads, one from the middle portion of the popliteal surface of the femur just above the condyles; the other from the posterior ligament of Winslow close to the plantaris muscle. This second slip was tendinous at its origin, and joined the outer side of the muscular slip opposite the knee-joint. This muscle, however, did not end in a tendon, but increasing slightly in size, joined the inner head of the gastrocnemius just before its union with the outer head.

Henle[3] also describes a third head ending in a round tendon, which spread out and joined the gastrocnemius and soleus at their point of union.

During the last year an instance has been recorded by Dr. Shepherd[4] of the absence of an external head. The abnormality occurred in a female subject. On removing the skin and the fascia the plantaris appeared. There was no trace of an external head.

## Arteries.

Variations in the origin, course, and distribution of the arteries have been very frequent. The arteries which have been most subject to such variations are the external circumflex in the leg, the thyroid axis, the thoracic axis and other branches of the axillary, and the branches of the brachial.

### *The Right Subclavian arising from the Third Part of the Arch of the Aorta.*

The right subclavian arose from the back and lower part of the third portion of the arch of the aorta. It ascended upwards and to the right, crossing the spine on a level with the sixth cervical vertebra behind the œsophagus and the trachea to the inner border of the first rib on the right side. The vertebral, internal mammary, thyroid axis, and superior intercostal were given off from it normally. The right carotid arose directly from the transverse part of the arch of the aorta, taking the place usually occupied by the innominate. The left carotid and

[1] St. Thomas' Hospital Reports, vol. vi., 1875.
[2] Wood, Proceedings of Royal Society, 1868.
[3] Henle, Handbuch der systematischen Anatomie des Menschen, vol. i.
[4] Montreal General Hospital Reports, vol. i., 1880.

left subclavian had normal origins. The left vertebral, smaller than usual, arose normally from the left subclavian. The left recurrent laryngeal coiled round the aorta as usual, and then ran in front of the right subclavian to the larynx in the interval between the œsophagus and the trachea. The left recurrent laryngeal came off straight from the pneumogastric, and ran direct to the larynx without coiling round the subclavian. One or two separate branches were given off directly from the pneumogastric to the trachea and œsophagus. The pneumogastric crossed in front of the right subclavian, the sympathetic behind. I have only once observed this abnormality, which is of considerable interest, part of the right subclavian being here supposed to represent the right posterior aortic root which has remained unobliterated, an explanation so well known that I need not further refer to it. The height that the right subclavian ascended into the neck, crossing the spine at the level of the sixth cervical vertebra, would have rendered it liable to have been wounded in the operations of œsophagotomy and extirpation of the pharynx—a consideration, however, of but little practical importance, seeing that such operations are rarely called for, and that the abnormality itself is rare.

A very interesting specimen bearing on this abnormality has recently been recorded by Dr. Shepherd of Montreal.[1] In it "an aberrant vessel was given off from the thoracic aorta opposite the fifth dorsal vertebra, and from here proceeded upwards and towards the right side, passing over the œsophagus behind the ascending arch of the aorta to the right bronchus, where it gave off two small branches to the bronchial glands. It then continued upwards in a tortuous course to the right side of the trachea, and ended by joining the subclavian in the second part of its course. The branches of the aorta were normal." Dr. Shepherd regards this vessel, which was about the size of a goose-quill, as the persistent posterior right aortic root; it differs from all other known examples of persistence of this root in that atrophy of the fourth right aortic arch had not taken place.

### *The Lachrymal a Branch of the Middle Meningeal.*

The lachrymal artery was given off from the trunk of the middle meningeal, and passed through a small foramen external to the sphenoidal fissure into the orbit, where it was distributed in the normal manner. It was connected by a few small twigs with the ophthalmic artery. The lachrymal and middle men-

[1] Montreal General Hospital Reports, vol. i., 1880.

ingeal arteries always anastomose by small branches running through the outer angle of the sphenoidal fissure, or through a foramen just external to that fissure. The distribution of the artery here described is probably due to an enlargement of one of those anastomosing vessels. A similar abnormality is noticed in "Guy's Hospital Reports," vol. xiv.

*A large Branch from the Superior Thyroid crossing the Trachea between the Cricoid Cartilage and the Isthmus of the Thyroid Body.*

The branch in question was the size of the radial. It came off from the superior thyroid where this vessel comes into contact with the lobe of the thyroid body. It crossed the trachea obliquely, and anastomosed with the superior and inferior thyroid arteries of the opposite side. I have seen three similar examples in the dissecting-room, and another in performing the operation of tracheotomy. In the last instance the artery crossed the trachea immediately below the cricoid cartilage, and was divided whilst finally clearing the trachea. It bled very freely until it was secured, and would no doubt have been serious had it been wounded whilst incising the trachea. Such a distribution is not so very uncommon, and I refer to these five cases merely to emphasise the importance of fully exposing and thoroughly clearing the trachea before opening it.

*The Right Bronchial derived from the Subclavian.*

This branch came off from the first part of the right subclavian artery, and ran a little to the right of the trachea to the back of the root of the right lung, where it turned outwards, and tracking along the right bronchus, was distributed in the usual way. The artery was about the size of a small crow-quill.

I am not aware that this abnormality has been previously recorded, although a very similar one, viz., the bronchial arteries arising by a common trunk from the subclavian, has been noticed by Haller. The bronchial arteries have also been seen descending into the thorax from the superior intercostal, internal mammary, and inferior thyroid arteries.

*A large Branch of the Internal Mammary running vertically behind the Ribs near their Angles.*

This branch, when injected the size of a crow-quill, came off from the left internal mammary about two inches from the origin of the latter from the subclavian, and after passing obliquely

outwards in the second left intercostal space, turned vertically downwards, and ran behind the intercostal spaces and ribs a little anteriorly to their angles, and ended below the fourth space in one of the anterior intercostals. It anastomosed by small lateral offsets with the intercostal vessels as it crossed them. The liability of such an abnormal artery to injury in the operation of tapping the chest is obvious.

*The Anterior Circumflex, the Posterior Circumflex, the Subscapular, the Superior Profunda, and the Inferior Profunda arising from the Axillary by a Common Trunk.*

In the arm, the following is by far the most frequent variation of the arteries that I have observed.

The trunk common to the above-mentioned vessels generally arises from the anterior and outer side of the axillary just below the insertion of the subscapularis. After a course of a quarter to half an inch it gives off the subscapular artery, which usually crosses over the axillary and courses along the lower border of the subscapularis, giving off the dorsalis scapulæ in the usual situation. After another quarter of an inch to an inch, the anterior and posterior circumflex come off together from the common trunk. The posterior circumflex passes under the teres major and latissimus dorsi to reach the deltoid. After another half inch to an inch and a half, the trunk generally divides into the superior and inferior profunda, the superior profunda passing to the outer side of the brachial to gain its normal position between the two heads of the triceps, the inferior profunda crossing over the brachial to join the ulnar nerve about the lower third of the arm.

*A large Branch from the Brachial Artery distributed as the Ulnar in the Palm; the Ulnar in the Forearm derived from the Brachial as usual.*

An account of this abnormality was published in the "Journal of Anatomy and Physiology"[1] by Mr. W. S. Richmond, who dissected the part.

"The brachial artery gave off a little higher than its middle a large branch which pierced the brachial aponeurosis, and ran superficially along the inner side of the upper and fore arms to the palm of the hand. It lay in its entire course in the superficial fascia, and gave off no branch before reaching the palm. It passed over the annular ligament on the outer side of the pisi-

[1] Vol. xiv.

form bone, and entered beneath the palmar fascia where it terminated by dividing into a superficial and a deep branch, the former of which formed the superficialis volæ branch of the radial, and formed the superficial arch, whilst the latter represented the profunda ulnaris and joined the deep arch. . . . The brachial artery divided in the usual way in the triangular space at the bend of the elbow." One branch formed the radial, the other was distributed as the ulnar, but only to the forearm.

*The Deep Epigastric given off by the Obturator.*

The deep epigastric on the right side was given off from the obturator just where the latter vessel passes through the obturator foramen. It coursed round the inner side of the femoral ring, then between the peritoneum and the fascia transversalis to the sheath of the rectus. There was no trace of any anastomosis between this vessel and any branch of the external iliac. It gave off the pubic branch. The cremasteric was very small, and was given off direct from the external iliac. The artery was not abnormal on the left side. It is exceedingly common to find the obturator arising from the epigastric, but not so the epigastric from the obturator. Two similar examples, however, have been recorded by Monro and Hesselbach.[1]

*An Accessory Pudic Artery crossing the Middle Line of the Body immediately above and in front of the Prostate.*

The accessory pudic in this instance arose from the trunk of the internal iliac just before its bifurcation, and coursed along the side of the bladder and prostate external to the capsule of the latter. At the side of the prostate, just behind the posterior layer of the triangular ligament, it divided into two branches; one branch pierced the posterior layer of the triangular ligament and broke up between the two layers into the artery of the bulb, the artery of the crus, and the dorsal artery of the penis. The other branch crossed the middle line of the body, immediately above and in front of the prostate, and then piercing the posterior layer of the triangular ligament on the right side of the body, gave off between the two layers of that ligament the *anterior* artery of the bulb, the *anterior* artery of the crus, and the dorsal artery of the penis. One inch and a half from its origin the accessory pudic gave off a middle hæmorrhoidal branch about four inches in length, which ran by the side of the rectum to within one inch of the anus, where it was distributed to the

[1] Morbid Anatomy of the Human Gullet (Monro). Die Sicherste Art des Bruchschnittes (Hesselbach).

walls of the bowel. On the left side the regular pudic was very small, but had a normal distribution supplementing the blood supply of the accessory. On the right side the regular pudic artery ended in the bulb.

An accessory pudic artery is not uncommon I have frequently seen it in the dissecting-rooms during the last seven years, and its course is generally described in the text-books on anatomy. But an accessory pudic crossing the middle line of the body is rare. Only one other instance of it has occurred within my experience.

There are many points of interest connected with this occasional occurrence of a pudic accessory, especially with regard to the lateral operation of lithotomy. There is not, as a rule, much danger of wounding the vessel, if the capsule of the prostate is not divided with the knife, as in all the examples that have occurred in our rooms the vessel was external to the capsule; and as far as I can gather this has been the experience of others. I have also found that when the accessory artery gives off the artery of the bulb, this latter branch is always higher than usual, and so, if anything, is less likely to be cut in the lateral operation than when it is derived in the ordinary way. The possible existence of a branch of the accessory pudic crossing the median line immediately above the prostate should not be lost sight of in the performance of the operation, recently proposed by Mr. Furneaux Jordan, of incising the prostate and the neck of the bladder in an upward direction. Such an incision in either of the bodies in which this abnormality has been observed must, I think, have led to a wounding of the vessel in question, and to considerable hæmorrhage, which, from the size and situation of the vessel, would have been serious and difficult to control.

## Veins.

### *A Left Superior Vena Cava.*

Three specimens of this interesting condition of the veins of the heart have come under notice during my connection with the anatomy-rooms. Two of them were exhibited by Mr. Furner at the Abernethian Society, and are briefly described by him in the Hospital Reports.[1] The present example was shown by me at the Pathological Society, and a short description is published in the Society's Transactions. As I was fortunate enough to see the abnormality before the relation of the parts had been disturbed or any of the communicating veins cut away, and consequently obtained the heart and the vessels in a perfect

[1] St. Bartholomew's Hospital Reports, vol. x., 1874.

state, it seems worth while to publish a detailed account of it. It occurred in an adult male. The heart was about the normal size. The right vena cava was smaller than natural, but pursued its accustomed course to the right auricle. On the left side the internal jugular and subclavian veins united to form not the normal left innominate vein, but a large vein, the so-called persistent left vena cava, which entered directly into the right auricle. In place of the left innominate vein a small transverse branch stretched across and in front of the great vessels at the root of the neck and united the two venæ cavæ. The persistent left vena cava passed downwards and in front of the arch of the aorta and root of the left lung, and piercing the fibrous layer of the pericardium on a level with the upper border of the right branch of the pulmonary artery, crossed the pulmonary vessels and reached the side of the left auricle immediately behind the appendix, and then turning backwards under the left lowermost pulmonary vein, ran obliquely in close contact with the left auricle, following the course of the auriculo-ventricular groove, and opened by a wide orifice into the right auricle a little behind and to the left side of the opening of the inferior vena cava; that is, in the normal situation of the opening of the coronary sinus. From the junction of the left internal jugular and subclavian veins to its termination in the right auricle the vein measured eight inches; from the aforesaid junction to the transverse branch, seven-eighths of an inch; from the transverse branch to the reflexion of the pericardium, two and a half inches. The portion of the vein outside the pericardium was smaller than the corresponding part of the right vena cava, the left measuring immediately below the transverse branch one inch and three-eighths in circumference, and immediately before it entered the pericardium one inch and a half, the right measuring in corresponding situations one inch and a half and one inch and five-eighths. The portion of the left vena cava outside the pericardium rested on the left carotid and left subclavian arteries and arch of the aorta; it had the phrenic nerve coursing along its left side, and it was in close relation with the left pleura. The portion inside the pericardium, as has been found in other cases, became very much dilated, measuring as much as two inches and five-eighths in circumference. As it passed from the left pulmonary artery to the root of the subjacent pulmonary vein, it was contained, as in Mr. Marshall's case, and to use his own words, in a tube-like fold of the serous membrane, the analogue of the vestigial fold. In the remainder of its course it was bound down by the serous layer of the pericardium. The opening of the left superior vena cava into the right auricle measured

seven-eighths of an inch in diameter; the opening of the right cava half an inch. The opening into the auricle was surrounded for a third of its circumference posteriorly and internally by a slight ridge continuous with the lower costa of the annulus ovalis in front, and terminating in a second ridge which partly surrounded the opening of the inferior vena cava, and to which the Eustachian valve was attached. There was no Thebesian valve guarding the orifice of the left cava, but a slight fold of the lining membrane occupied the usual situation of the valve.

The left vena cava, above the transverse branch connecting it with the right vena cava, received the left vertebral, the left internal mammary, and the deep cervical veins, all of which were guarded by semilunar valves. Three-eighths of an inch above the reflexion of the pericardium the left cava received a large branch which arched over the root of the left lung, and received the veins from the five upper intercostal spaces. This branch communicated below with a third azygos vein, which in its turn communicated below with the vena azygos minor. As pointed out by Mr. Marshall, this branch is a left azygos, and is formed by the persistence of a part of the left cardinal vein. It measured one-eighth of an inch in diameter. The right azygos or azygos major measured three-sixteenths of an inch in diameter and had normal relations.

The transverse branch that has already been mentioned as stretching between the two venæ cavæ measured about two and a half inches in length. It came off obliquely from the inner side of the left vena cava, and running slightly forwards and downwards across the roots of the three great branches of the aortic arch, terminated also in an oblique manner in the right cava. At its origin from the left cava it measured a quarter of an inch in circumference, but shrunk until, half an inch farther down, it only admitted a coarse bristle. About the middle of its course it received a large thyroid vein measuring one-eighth of an inch in diameter, and from this point to its termination in the right cava its diameter increased to a little over an eighth of an inch. There were no valves at either of the openings into the right and left cavæ. The entrance of the inferior thyroid into the transverse branch was guarded by two valves.

Within the pericardium the persistent vena cava, as it wound below the left lower pulmonary vein, received the great coronary vein, which was guarded by two valves, and farther on, about half an inch before it terminated in the right auricle, it received the posterior cardiac vein. There was a well-marked Eustachian valve at the orifice of the inferior vena cava. This valve, as is frequently the case, was cribriform. The foramen ovale was

perfectly closed, as was also the ductus arteriosus. The rest of the heart was normal.

The right innominate vein measured one inch and a half in length, and received in addition to the internal jugular and subclavian veins the right inferior thyroid veins. The right internal mammary, as is often the case, terminated in the vena cava just after its commencement; the right vertebral and the right deep cervical vein terminated in the subclavian. The right vena cava measured three inches in length, and received, in addition to the internal mammary, the right innominate and the transverse branch from the left cava, the vena azygos major. The right cava was slightly constricted on its entrance into the auricle. There were four pulmonary veins, two on each side; the other vessels were normal.

This specimen is of interest, not because it throws any new light upon the development of the great anterior veins, so admirably worked out by Mr. Marshall, but rather because it is perhaps the most perfect specimen of this rare persistence of the left venous trunk in the adult that has as yet been recorded. Of the thirty-one cases of double vena cava collected by Mr. Marshall, the descriptions of the majority are incomplete, especially as to the presence of a cross branch in the neck and as to the condition of the azygos veins. Only eleven examples occurred in adults; "in two instances only is the cross branch placed beyond a doubt," and the condition of the azygos veins is accurately known in only four cases.

Since the publication of Mr. Marshall's paper several examples of persistence in a greater or less degree of the left duct of Cuvier and the left primitive and jugular veins have been from time to time published. Thus Grüber[1] has described an S-shaped vein uniting the coronary sinus to the superior intercostal vein, and a vena hema-azygos opening into the coronary sinus instead of into the vena azygos major. Dr. Greenfield showed at the Pathological Society during the session of 1876 a unique specimen, in which not only was the left duct of Cuvier persistent, but the right had been suppressed.

The dilated condition of the intra-pericardial portion of the persistent left cava seems also of interest. The same striking dilatation appears to have existed in all the examples of persistent cavæ that have been recorded, but I have not met with any explanation of it. At first sight it would appear that the increase in size of this portion of the vessel was simply due to its being joined by the great coronary vein. That it is in some measure due to this cause is evident. But the increase in area is greater

[1] Archiv. für path. Anat., Virchow, B. 2, 1865; and Archiv. für Anat. Physiol., &c., Reichert, 1864.

than the combined area of the two veins together, proving conclusively that the dilatation is in part due to another cause. Rather it seems to me that the intra-pericardial portion has yielded to the backward pressure of the blood during the contraction of the auricle. Such a yielding would not seem improbable when we remember that this part of the vein consists of what is usually the coronary sinus; and the coronary sinus being provided with a valve, is not called upon to resist the backward pressure of blood during the auricular systole, and has consequently thinner walls than the intra-pericardial portion of the right vena cava. The absence of the Thebesian valve in this specimen, in connection with the thinner walls of the intra-pericardial portion of the vein, would therefore seem to account for the dilatation. The absence of this valve may be explained on the supposition that the increase in the size of the orifice of the left cava (following upon the large amount of blood it had to transmit) by stretching the valve had rendered it useless, and that it had consequently shrunk into the slight fold of lining membrane occupying the posterior and inner margin of the orifice.

*The Common Iliac Veins running on each side of the Aorta as high as the Renal before uniting to form the Inferior Vena Cava.*

The left common iliac vein, instead of crossing under the right common iliac artery and joining the right common iliac vein to form the inferior vena cava, ran behind the left common iliac artery and then proceeded along the left side of the abdominal aorta as far as the left renal vein, which it joined at a right angle; then turning almost transversely to the right, it crossed the front of the aorta and joined the right common iliac vein. The latter vein ran up on the right side of the aorta and terminated, after joining the left vein as above described, in a short inferior vena cava. The left common iliac vein, a little to the left of the corresponding artery, was joined by a large branch which ran obliquely across the first piece of the sacrum and the fifth and fourth lumbar vertebræ. This branch began in the right internal iliac vein half an inch from the junction of the latter with the right external iliac vein. It received in its course the right lateral sacral vein, the middle sacral vein, and a small transverse branch which crossed under the right common iliac artery and joined the right common iliac vein. The left spermatic vein terminated at the angle of junction of the left common iliac vein with the renal of the same side. The left capsular vein opened

into the trunk formed by the junction of the renal and left common iliac. The right renal joined the inferior vena cava at the confluence of the right common iliac with the conjoined left common iliac and renal veins. There were two spermatic veins on the right side; one joined the right common iliac an inch

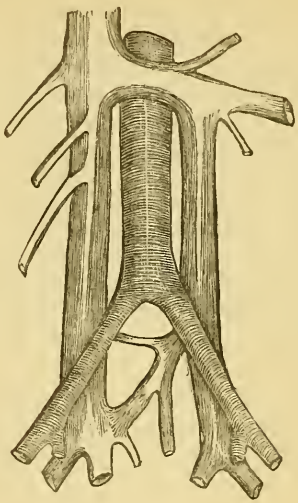

Fig. 9.

below the inferior vena cava, the other opened into the vena cava at the angle of union of the right common iliac with the united left common iliac and renal veins.

I am not aware that any explanation has been offered of this abnormality. One would surmise, however, that it was capable of an explanation similar to that given for the left persistent vena cava superior, viz., that in early fœtal life the vein is normally double, and that the left is usually suppressed—a view which at first sight seems supported by the fact that the vena cava inferior has been seen to run up on the right of the aorta in a subject in which there was no transposition of the viscera.[1] This, however, is not in accordance with the present teaching of embryologists. It may be that the presence of the two veins is simply due to the right and left common iliac veins having failed to unite in the usual situation, although this does not explain the occasional existence of the inferior vena cava on the right side of the aorta in cases of non-transposition of the viscera.

[1] St. Thomas' Hospital Reports, vol. vi.

### *A Double Left Renal Vein.*

The left renal vein, after receiving the left capsular vein as usual, divided into two branches, one of which, the larger, crossed in front, the other and smaller behind the aorta. They opened by two distinct orifices into the vena cava, one anteriorly to the other. The posterior branch received the spermatic and

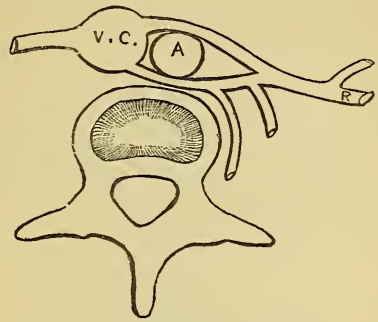


Fig. 10.[1]

also the third left lumbar vein. The renal vein has been seen running behind the aorta, but, as far as I know, not embracing it, as in this instance. Small ramifications generally run between the renal and the lumbar veins, and the branch of the renal running behind the aorta might be regarded as consisting in part of a large third lumbar vein, and in part as an enlargement of the ramification which runs between the lumbar vein and the renal. Against this view is the fact of the spermatic vein opening into the posterior branch of the abnormal vein.

## Lymphatics.

### *The Thoracic Duct ending on the right side in the Confluence of the Internal Jugular and Subclavian Veins.*

The duct began at the receptaculum chyli, and ran through the posterior mediastinum between the vena azygos major and the aorta in the normal manner; but instead of passing behind the œsophagus and aorta to the left side as usual, it continued its course upwards on the right side between the œsophagus and the vertebral column, and after crossing in front of the right subclavian artery, which in this subject was derived from the

[1] (Fig. 10.) V. C. = Vena Cava; A = Aorta; R = Renal Vein.

third part of the arch of the aorta, terminated at the confluence of the right internal jugular and subclavian veins.

A similar instance has been recorded by Dr. Watson.[1] Dr. Allen Thomson has also seen the duct ending on the right side, but in his case there was a right aortic arch.

In birds there are two thoracic ducts, running side by side, and opening directly into the jugular vein. In the kangaroo, the dog, and the sea-otter there are two thoracic ducts. They begin in the thorax at the receptaculum chyli, which in these animals passes through the diaphragm, and run up on each side of the dorsal vertebræ as high as the seventh, where the right duct crosses and joins the left, and thence, after forming a slight plexus, terminates at the confluence of the left jugular and subclavian veins. In the ox the duct usually bifurcates, the two divisions diverging to the right and left innominate veins formed by the jugulars and axillaries.

## Nerves.

### *The Buccal Branch given off from the Superior Maxillary Division of the Fifth Nerve.*

This branch was given off from the superior maxillary trunk as it crossed the spheno-maxillary fossa, just beyond the origin of the ganglionic branches. It ran along the anterior border of the tendon of the temporal muscle, with a small twig from the alveolar branch of the internal maxillary artery, and entered the buccinator muscle at the usual situation. This abnormality is of considerable interest, as it furnishes an additional argument in favour of the purely sensitive function of the buccal branch of the fifth. A similar distribution has twice been recorded by Professor Turner,[2] and in two instances a large nerve coming from the superior maxillary through the spheno-maxillary fissure from the orbit into the pterygoid space has been noticed at Guy's Hospital.[3] The nerve had been cut in both instances, and the other branches in its neighbourhood destroyed, before it was noticed. It was thought to be probably an abnormal buccal.

### *Abnormal Course of the Phrenic Nerve.*

The nerve arose from the third, fourth, and fifth cervical cords as usual, but ran along the outer edge of the scalenus anticus,

[1] Journal of Anatomy and Physiology, vol. vi. p. 427.
[2] Ibid., November 1866, p. 33.
[3] Guy's Hospital Reports, vol. xiv. p. 452.

instead of crossing this muscle obliquely from without inwards. After passing under the transversalis colli and the supra-scapular arteries and the transversalis colli vein, it turned over the supra-scapular vein at the spot where this latter vein joins the external jugular, and then passed under the junction of the internal jugular and subclavian veins almost transversely across the scalenus anticus, and after crossing the root of the internal mammary artery, proceeded in the normal manner through the thorax to the diaphragm. In a second instance the phrenic nerve was also noticed running along the outer border

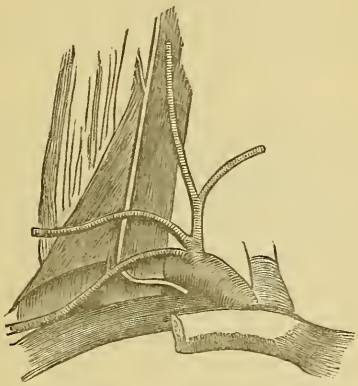

Fig. 11.

of the scalenus anticus, but in this case it wound round the loop formed by the junction of the internal jugular and subclavian veins. It appeared to be held in this abnormal situation by the branch which it received from the nerve to the subclavius. The latter nerve was of large size and in a state of tension. The supra-scapular and transversalis colli arteries, and the transversalis colli vein crossed under the nerve, instead of over it as usual.

The fact that the phrenic nerve may occasionally run along the outer edge of the scalenus anticus, instead of obliquely across it, is of importance with reference to ligature of the subclavian artery in the third part of its course, and is suggestive of the desirability of avoiding the anterior surface of the muscle in performing that operation.

*The Phrenic Nerve crossing in front of the Left Innominate Vein.*

The nerve, the origin of which was normal, after crossing in front of the transversalis colli and supra-scapular arteries, passed in front instead of behind the left innominate vein. Where it crossed the vein it was joined by the branch from the nerve to the subclavius.

VISCERA.

*Abnormal Peritoneal Attachments of the Small and Large Intestines.*

The following peculiar arrangement of the peritoneum occurred in the body of a well-developed adult female subject.

The stomach and its peritoneal connections were normal. The mesentery, at its posterior or attached border, extended obliquely across the spine from the left side of the second lumbar vertebra to the bifurcation of the right common iliac artery, and included in its free or intestinal border not only the jejunum and ileum, but also the cæcum and three inches of the ascending colon. The cæcum lay in the left iliac fossa, but could be moved freely into the right and into the pelvis. The ascending colon ran first from *left to right* in a gentle curve, with its concavity upwards, across the lower part of the umbilical region to the lower end of the attached border of the mesentery at the bifurcation of the right common iliac artery, and then turned upwards, still continuing in the umbilical region. The colon, from the bifurcation of the right common iliac artery to the hepatic flexure, was attached to the right side of the bodies of the lower lumbar vertebræ by a short ascending meso-colon continuous with the lower end of the mesentery, so leaving to the right of the ascending colon a peritoneal fossa measuring four inches transversely. In other words, the peritoneum was continued from the lateral walls of the abdomen over the quadratus lumborum, the psoas, and the descending portion of the duodenum to the right side of the lumbar vertebræ over the colon back to the spine, then was reflected over the small intestines forming the mesentery, and thence proceeded in the usual manner over the descending colon to the abdominal walls. The descending portion of the duodenum lay two inches to the right of the ascending colon, bulging slightly over the outer edge of the quadratus lumborum. Coils of small intestine were found occupying the fossa, which lay, as previously mentioned, to the right of the ascending colon, and

into which also the lower part of the sigmoid flexure could be placed. From the hepatic flexure the colon turned to the left to form the transverse part of the arch, and then downwards in the usual manner to form the descending colon. On a level with the crest of the left ilium a reflexion of peritoneum containing the sigmoid flexure in its free margin extended transversely across the spine at the level of the fifth lumbar vertebra to the right iliac fossa, where the sigmoid flexure became the rectum. The rectum descended into the pelvis from *right to left,* and was attached to the back of the pelvis by a short mesorectum. The sigmoid flexure measured thirty-five inches in

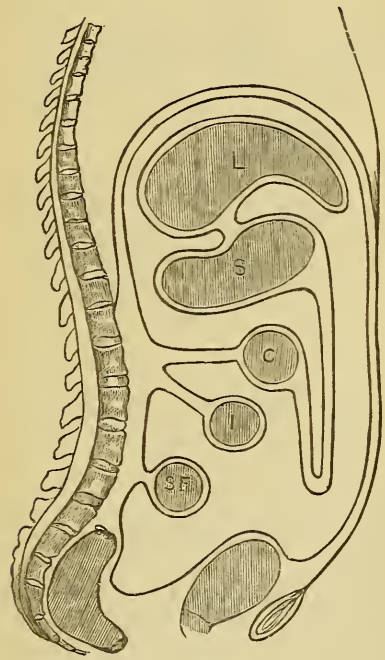


Fig. 12.[1]

length. The peritoneal fold attaching it to the back of the abdominal cavity allowed this part of the bowel to be moved as high as the right kidney.

This description of the reflexion of the peritoneum will perhaps be better followed by the aid of the accompanying diagrams.

[1] (Fig. 12.) L = Liver; S = Stomach; C = Colon; I = Small intestines; S F = Sigmoid flexure.

There was no appearance of adhesions or of other signs of former peritonitis; indeed, the great length of the sigmoid flexure alone points to the abnormality being one of congenital origin. This is the first instance of the kind that I have met with, and I am not aware that such a one has been described. Dr. Shepherd of Montreal, however, has seen the descending colon cross the spinal column from left to right about the level of the fourth lumbar vertebra, whence it descended to the right sacro-iliac synchondrosis and formed the rectum, which passed into the pelvis from

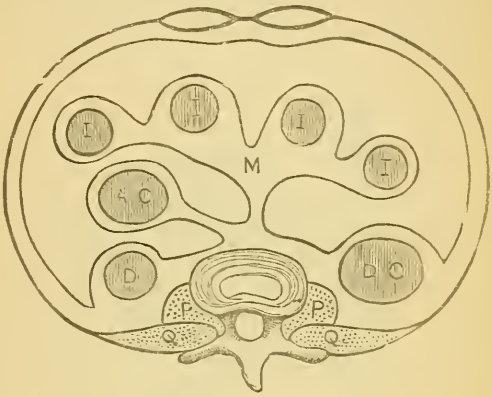


Fig. 13.[1]

right to left. The descending colon was covered in front only by peritoneum, by which it was bound tightly down to the abdominal aorta.

From a surgical point of view the abnormality is interesting in several respects. The only portion of intestine in the right lumbar region uncovered by peritoneum was a part of the descending duodenum, which lay a little to the right of the quadratus lumborum, the ascending colon being altogether to the left of that muscle, and completely surrounded by the serous membrane. Should colotomy have been called for, the duodenum would have run the risk of being opened; but such a risk, this arrangement being so rare, may be thought remote. The duodenum, however, frequently projects, as in this case, to the right of the quadratus lumborum, and the ascending colon is as frequently completely surrounded with peritoneum; a point that does not seem to have attracted the notice which it appears to me to deserve.

[1] (Fig. 13.) I = Small intestines; A C = Ascending colon; D C = Descending colon; D = Duodenum; M = Mesentery; P = Psoas; Q = Quadratus Lumborum.

The fact that the ascending colon is often surrounded with peritoneum is, of course, well recognised; but the more important fact that the only portion of the intestine uncovered by peritoneum in the lumbar region may be the duodenum does not seem to be so generally known. The recognition of such a condition of the parts is certainly attended with difficulty in the performance of colotomy on the dead body; and to show that the risk of opening the duodenum in mistake for the colon in the performance of the operation on the living is not altogether chimerical, I may state that such an accident, to my own personal knowledge, has occurred to a surgeon with much experience in this operation.

Such an occasional course and attachments of the sigmoid flexure and rectum are suggestive of caution in attempts to pass the whole hand through them from the anus for the purpose of exploring the pelvis of the kidney for stone.

### *A Septed Uterus and Double Vagina.*

The uterus was, to outward appearance, single, but was divided internally by a longitudinal median septum into two cavities, each of which was connected with the corresponding Fallopian tube. The septum extended through the cervical portion of the uterus into the vagina almost as far as the pudenda. The right cavity of the uterus and right vagina were slightly larger than the left. The right os was round and slightly puckered, like that of a uterus that has been impregnated; the left had the characters of the os of a virgin uterus. Externally the vagina presented a longitudinal median groove along its upper and lower walls, indicating the situation of the septum within.

The abnormality, which belongs to the class called by Kussmaul "Uterus septus cum vaginâ duplici," seems to depend upon a defective development in the Müllerian ducts about the second month of intra-uterine life. The contiguous and already blended walls of the ducts, instead of becoming absorbed, and so giving rise to a single uterine cavity and vagina, remained, and became developed into a septum of considerable thickness. The parts were taken from the body of a middle-aged female subject, of whom no history could be obtained.

ON

# A CASE OF DELIRIUM TREMENS

## COMPLICATED BY JAUNDICE.

BY

J. WICKHAM LEGG, M.D.

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The combination of delirium tremens and jaundice seems to be somewhat rare. I have not been able to find such a complication spoken of in the books on jaundice which I have consulted, nor in the article on delirium tremens which Näcke has lately published,[1] and in the preparation of which he seems to have looked over the greater part of the literature of the subject. But Leyden noted, in his essay on jaundice, that he saw certain cases of this sort when assistant to Traube in the *Charité* at Berlin, and that the mortality was very great.[2] I think, therefore, that the following case of three attacks of jaundice, each time complicated with delirium tremens, and ending in recovery, may be of interest.

For the opportunity of observing this case I am indebted to Dr. Gee, who kindly transferred the man to my care soon after the patient was admitted into the Hospital. There was no doubt that the man had been accustomed to drink a great deal of whisky, though at first he stoutly denied that he took spirits to excess. He had had three attacks of jaundice, all of which ran the following course: First, vomiting and diarrhœa, of greater or less intensity, for a few days; then the appearance of jaundice; after the jaundice had been established some hours, great pain in the right hypochondrium and belly came on; then,

[1] Näcke, Deutsches Arch. f. klin. Med. 1880, Bd. xxv. p. 416.

[2] Leyden, Beiträge zur Pathologie des Icterus, Berlin, 1866, p. 131. Leyden promises, at p. 133, to give the details of two fatal cases; but these I have been unable to recognise in the cases reported. This is the more to be regretted, as the appearances after death would be very important in removing any suspicion that the cases were those of *icterus gravis* from alcohol. All the symptoms and morbid appearances of ordinary acute yellow atrophy have been seen after poisoning by alcohol.

commonly after an interval of some days, delirium showed itself,—delirium with all the characters of that commonly set down to excess in spirits. After a few days of this delirium tremens, the nervous symptoms ceased, leaving the jaundice, however, to last for several weeks longer, at the end of which time the man regained his accustomed health.

Delirium in jaundice is always alarming, and in this case it was rendered still more so by the absence, at the moment, of the history of the former attacks. However, no hæmorrhages or changes in the temperature were noticed, but the history of excess in spirits and the distinct character of the delirium, plainly *delirium potatorum,* added much to my anxiety, when Leyden's cases were remembered. Nevertheless, as the following notes will show, the case ended favourably for the time.

For these notes I am indebted to Mr. Hall, the clinical clerk who watched the case.

Robert C., aged 43, ham and tongue curer, was admitted on Saturday, May 29, complaining of pain in the hepatic region and "jaundice."

*Previous history.*—He was quite well up to May 21, when he noticed his skin becoming yellow. The colour became deeper without his experiencing any abnormal sensations other than those accompanying the acts of retching and vomiting, which he went through every morning from the date mentioned, and occasionally after meals. On May 26, however, he began to feel dull and languid, and to have pains in the hepatic region of a shooting and "griping" character. About the same time he noticed his motions to be very light coloured. On May 20 he passed a long worm with several bits.

He has had two similar attacks before—the first two years ago, and the other just a year ago. In both attacks there was first vomiting for some days, then jaundice, then pain, then delirium. He has been subject to morning vomiting for years. Within the last few months he has lost much flesh. His nose has bled at times during the same period. Never seen any blood in the stools. He is not, nor has he been, addicted to heavy drinking; as a rule takes about 2 oz. of spirits a day.

*Present condition.*—The patient is a well-conditioned, red-haired man.

The skin of the face, skin generally, and the conjunctivæ have the icteric tint.

The tongue is very rough, furred, and dry. His appetite is good. He often vomits after meals; the vomit having a yellowish colour and bitter taste.

The stools are thin and very light coloured; offensive smell.

He is troubled very much with "the wind."

Examination detects nothing abnormal in the chest.

The liver dulness is not increased. Pressure in the epigastrum and over the gall bladder elicits signs of pain.

The abdomen is full and tympanitic. Spleen not enlarged.

Urine is of a brownish yellow colour, and deposits a dark sediment. Sp. gr. 1030; no albumen; nitric acid at once and in the cold gives a dark green coloration. Pulse 96. Temp. normal.

On May 30 he became delirious and noisy, and was on that account removed to Casualty Ward.

June 2.—Had a good night's rest, and slept well after morphia injection. Temperature normal. Urine much clearer; strong reaction with nitric acid. Removed back to Luke's Ward.

4.—Feels much better this morning; slept very well. Bowels open three times since yesterday. Motions darker. Skin much paler. Still complains of a little constant pain in the region of the liver.

6.—Intermittent pains across the abdomen, increased by taking food. Skin and conjunctivæ much yellower. Had little sleep last night. Dull pains in the head. Bowels open three times.

8.—No severe pain since yesterday. Slept well. Bowels open three times in night. Urine, sp. gr. 1010; no albumen; bile.

9.—Still has the pain. Bowels open four times; motions loose and still pale. No stone found on examining them.

Pain continued, more or less, up to June 18th.

Complained of itching of skin about feet and elbows for some days.

Also had some diarrhœa from June 19th to 25th.

Discharged on July 5th, 1880.

There are notes that he was in Luke's Ward from December 5th to December 12th, 1878, and that he then had delirium tremens and was removed to Casualty Ward.

There are also notes that he was in Matthew's Ward from April 22d to May 26th, 1879, into which he was admitted for jaundice and symptoms of incipient delirium tremens.

Dr. Steavenson, the House Physician, under whose care he was, says that there was distinct delirium tremens both in December and in April, together with jaundice; and that both the man and his wife then owned that he drank spirits to excess, though now it seems his cue to deny it.

I saw this man again in October; he had never been free from jaundice since he left the Hospital in July, and the edge of the liver could now be felt midway between the ribs and the umbilicus.

# ON DILATATION OF THE URETERS

IN

# EXTROVERSION OF THE BLADDER.

BY

FRANCIS HENRY CHAMPNEYS, M.B.

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The subject of this communication is suggested by a valuable paper by Dr. Alexander James[1] on hydronephrosis and dilatation of the ureters, in connection with incontinence of urine. The paper concerns three boys afflicted with enuresis, who died, and in two of whom (no autopsy being obtainable in the third) double hydronephrosis and dilatation of both ureters was found.

The cases are briefly the following :—

J. G., aged 8, had an injury when aged 3, resulting in phimosis, soon followed by diurnal and nocturnal enuresis. Circumcision gave slight temporary relief, but death followed an attack of coma after diarrhœa. The amount of urine passed in the 24 hours was not ascertained, but it was pale and of a low sp. gr. 1010, containing pus and renal cells, with a trace of albumen.

At the autopsy, the bladder was found contracted, the muscular coat thickened, and forming ribs projecting into its cavity, the walls when distended being $\frac{1}{4}$ inch thick; no cystitis, no stricture of urethra or ureters; both ureters and pelves of kidneys greatly dilated—double hydronephrosis.

Two other boys died similarly after enuresis produced by some abnormal state of the prepuce, and in the only one of them in whom an autopsy could be held, the post-mortem appearances were similar. Also their urine was pale, of a low specific gravity, and contained some pus and albumen.

Dr. James's explanation is the following: Irritation at the prepuce irritates the bladder, *i.e.*, causes it to contract frequently and violently, damming up the urine in the ureters, and this may amount to serious obstruction, dilatation, and hydronephrosis.

[1] Edinburgh Medical Journal, 1878, p. 135.

The obstruction is not situated in the urethra, because the bladder is contracted rather than dilated. A parallel exists in the case of surgical kidney associated with stone in the bladder; here the case is the same, except that the irritation exists in the bladder, and not in the prepuce. Dr. James remarks that in children with incontinence the specific gravity is low; when it is cured the specific gravity rises. This point of the specific gravity is important. Unfortunately it is almost impossible to collect all the urine in the twenty-four hours in cases of enuresis, and various circumstances may combine to lower the specific gravity on any separate occasions. Still it is a matter of common observation that whenever the urine of these patients is examined it is usually of low specific gravity. Hermann and Ludwig found that though in moderate obstruction the watery part of the urine is more diminished than the solids, yet in considerable obstruction the salts sink very considerably, and the sodium chloride nearly disappears, the urea being almost entirely replaced by creatin. In other words, a lower pressure suffices to stop the secretion of the solids than is required to stop the excretion of the water.

Heidenhain[1] found that ligature of an ureter hinders the excretion of indigo injected into the blood. Löbell[2] (whom I quote from Wundt's "Lehrb. der Phys.," 4 Auflage, Stuttgart, 1878) found that when the pressure in the ureter equalled 7 to 10 mm. of mercury, the secretion of urine ceased; and that if the ureter is connected with a manometer, the mercury soon reaches this height, and there remains.

But Hermann[3] found that if the ureter be closed for two hours or more, the pressure continues to rise, and eventually reaches 40 to 60 mm. of mercury; but the fluid secreted under these circumstances is not like urine, for it contains hardly any common salt or urea, but much creatin. At a considerably lower pressure the salts ceased to be secreted, the water, however, still being excreted. It is a well-known clinical fact, that urine secreted under mechanical obstruction is of very low specific gravity[4] (as in cases of calculus in the ureter of a solitary or functionally solitary kidney).

Dilatation of the ureters and kidneys is a sign of gradual and incomplete obstruction,[5] life not being sufficiently long maintained in cases of absolute obstruction to permit of their gradual dilatation and growth. Dr. James's conclusions are—(1.) That increased frequency of micturition is capable of damming up the

[1] Pflüger's Arch., Band ix., 1874, p. 10.
[2] De Conditionibus Quibusdam, &c., Marzburg, 1849, p. 30.
[3] Henle and Pfeuffer's Zeitschrift, 1863, S. 1, Band xvii.
[4] Roberts, U. and R. Diseases, 2d ed. p. 27.
[5] Roberts, p. 36.

urine in the ureters and kidneys, such obstruction being marked by the pale colour and low specific gravity of the urine; and (2.) that this obstruction may cause dilatation of the ureters and hydronephrosis.

This view receives remarkable confirmation from the state of the ureters in cases of extroversion of the bladder.

I will not here cite a long list of cases, but will refer to my paper in the thirteenth volume of these Reports, and to the statement there made (p. 92)—"The ureters are nearly always dilated, and with them the pelves of the kidneys; they are also lengthened, and, instead of running straight to the bladder, descend into the pelvis, and ascend again towards the bladder. In one case they were two inches wide (Petit); in Sir Astley Cooper's they were larger than the rectum; in another case the right measured nine and a half Paris inches in length, the left fourteen (Mörgelin); in Schneider's Case 10, one kidney had two ureters. In Bartels' case the right ureter (the left kidney and ureter being absent) was convoluted, its calibre varying from that of a fine bristle to that of a pencil, and opened into the right half of a double vagina. In cases in which the ureters open abnormally, they are sometimes dilated, sometimes not. For instance, in Saviard's Obs. 94, the common ureter, which opened into the rectum, was not dilated; in Bousquet's case, in which both ureters opened at the orifice of a cloaca, they were not dilated; but in Thilow's case, in which both ureters ended in the urethra, they were much dilated; in this case, however, they were not specially examined as to the existence of an obstruction; in Blasius' case, where they ended in a similar manner, they were much dilated." In my own case, "both ureters are much dilated at various points, especially at their lower end, the diameter of their largest parts being more than a quarter of an inch. No obstruction anywhere. Right ureter = six and a half inches long, left = five inches long." "The kidneys have often dilated pelves." In my own case "both pelves markedly dilated."

The conditions in the two sets of cases show a remarkable resemblance; in both, in spite of apparently unusual facilities for getting rid of the urine, the pathological conditions are those of obstruction. In the case of extroversion, dilatation is the rule, any structural obstruction is the exception. In the case of incontinence there is no obstruction below the bladder; the bladder itself shows no signs of dilatation, but rather of contraction. In both cases the signs of obstruction begin at the orifices of the ureters. In the case of incontinence, the cause of the irritation of the bladder may be in the bladder or remote from it. In the case of extroversion, the obstruction cannot be higher or lower

than the orifices of the ureters. In this case the possibility of irritation is not far to seek; we need only recall the red and easily bleeding surface of the extroverted bladder. That this is the cause of the dilatation is rendered more probable by the fact that ureters ending elsewhere than in the bladder are by no means so often dilated.

In dealing with the problem of dilatation in connection with enuresis, nature has, as it were, helped us to a solution by eliminating in extroversion all the non-essential parts of the organs concerned. I therefore adopt Dr. James's theory of the dilatation of the ureters and kidneys in incontinence for the same conditions in extroversion of the bladder; and would remark, that this association of symptoms and pathological conditions is, after all, but an unexpected rider to the well-known axiom, "Dribbling of urine is often a symptom of retention of urine."

It may be objected that there is no evidence to show that dilatation is anything but a very exceptional concomitant or consequence of incontinence. It is, of course, true that children rarely die with enuresis; but, on the other hand, enuresis is of various degrees, and again it is usually temporary; and there is some evidence of obstruction to the ureters in the low specific gravity of the urine, which is usually observed during incontinence, though this evidence is not secure from error. The difficulties of collecting the urine are still greater in extroversion than in incontinence, and no trustworthy observations on its specific gravity have, so far as I know, been yet made.

It is probable that contraction of the bladder, at least if strong, closes the orifices of the ureters, and dams up the urine in them. The question whether this shall produce dilatation above depends on the length of time during which the closure of the ureters lasts and the frequency with which it recurs. This applies to cases of both classes.

In the case of enuresis after birth it is, as above said, necessary that the obstruction should not be absolute or too long continued if life is to be maintained; whereas, in the case of the fœtus with extroversion, however complete the obstruction, the blood would be kept sufficiently purified by the placenta. After birth this advantage ceases. As is well known, life may be prolonged indefinitely in cases of extroversion; some cases, however, die soon after birth; in my case the child died at a month old after convulsions. It is possible that in such cases the cause of death may be uræmia.

The point is one of great interest in the very practical subject of the treatment of incontinence of urine.

# NOTE

ON

# A MODE OF ANTISEPTIC DRESSING.

BY

WALTER PYE.

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I believe it will be found to be in the experience of all who adopt Professor Lister's method of dressing wounds that the gauze bandages are often very irritating to the skin; this is especially the case in hot weather, and when the dressing is applied anywhere on the trunk. The irritation is not felt at all in some cases, while in others it is great enough to produce a well-marked eczematous or ecthymatous eruption.

For the last six months, while carrying out in every other respect all the ordinary antiseptic precautions, instead of the prepared gauze I have used a layer of cotton wool impregnated with salicylic acid as a dressing for operation wounds, in the hope of getting rid of the irritation caused by the former material, and of simplifying, if possible, the somewhat complex details of antiseptic dressing.

The operation having been performed under the spray, &c., the lips of the wound have been either painted with carbolic oil or covered with a strip of protective, and then the whole region has been covered with the prepared wool, a drainage tube being so arranged as to allow of the free escape of discharges into it.

For the purpose of securing asepsis an extremely thin layer of the wool seems to be sufficient; but as the discharges may become septic as soon as they have soaked through to the outside of the dressing, it has been found necessary to use a layer of sufficient thickness to ensure that this shall not occur in the intervals between the dressing of the wounds.

Of course, bandages or strapping of any kind may be used

outside the cotton-wool dressings to secure them in position or to produce pressure.

As far as comfort to the patient is concerned, this form of dressing certainly has seemed to be an improvement on the usual plan; and it has to be considered whether it is equally efficacious in securing asepsis.

Appended to this note is a list of all the operation wounds I have dressed in this way. It is, I hope, sufficiently long to enable me to say that wounds thus treated heal under the same conditions as they do under the Listerian method.

A wound may be considered to have run a perfectly aseptic course when there is throughout its healing no fever and no suppuration. There is, however, a slightly less perfect way of healing, which is, so far as I have seen, fairly common among all who use antiseptic precautions, and which may, from a clinical point of view, be regarded as aseptic, namely, when there is no fever throughout, and no suppuration until the healing of the wound has well advanced, when a small quantity of healthy sweet pus is formed.

All cases in which, after antiseptic precautions have been used, there develops traumatic fever or profuse suppuration, or both of these, must be regarded as failures, however well the patient may recover; and this is, of course, still more true of those cases in which any local inflammation develops in the wound.

The accompanying table gives an analysis of ten operation cases of varying severity, being all in which I have used this dressing. The facts brought out are—(1.) The nature of the operation; (2.) the development or non-development of fever as a consequence of the wound; (3.) the formation or non-formation of pus. The fact that they all recovered is of no importance as regards the object of this note, for they were all cases which should have got well eventually, whatever the treatment after operation had been.

It will be seen from the appended table that out of ten cases of surgical wounds—

*six* healed perfectly aseptically, that is, without any constitutional disturbance and without the formation of any pus;

*two* healed without constitutional disturbance, and with slight suppuration in the latter stages of the healing;

*one* (Case VI.) healed without constitutional disturbance, but with profuse sanguineo-serous discharge during a portion of the healing period;

*one* ran a typically septic course, with high temperature, erysipelatous blush, and profuse, often offensive suppuration.

| No. | Nature of Operation. | Highest Temperature after Operation. | Suppuration. | Result. |
|---|---|---|---|---|
| 1. Char. G. | Removal of large scirrhus of mamma and axillary glands. | 99.5° on evening of operation, then normal till discharged. | None throughout. | R. |
| 2. Anne A. | Removal of fatty tumour from forearm, compressing the radial nerve. | Temperature never rose to 99°. | None throughout. | R. |
| 3. Mary D. | Chronic disease of carpus; amputation lower third of forearm. | Temp. fell from 100° on morning of operation to 99.5° in evening, and then to normal on following day. | Pus formed eight days after amputation; not profuse; wound reported healed ten days later. | R. |
| 4. E. O'D. | Removal of moderate-sized scirrhus of mamma. | Temperature under 99° throughout. | None throughout. | R. |
| 5. Mary T. | Removal of chronic mammary tumour. | No rise of temperature after operation. | None throughout. | R. |
| 6. Julia S. | Removal of recurrent sarcomatous tumour springing from periosteum of tibia (a good deal of skin and muscular tissue and some bone were taken away). | No rise of temperature after operation. | No pus for three weeks after operation, then a free sanguineo-purulent discharge from that portion of wound which could not be closed at time of operation. | General health good when discharged; wound healed soundly, but tumour recurred in different part of leg; refused to undergo amputation. |
| 7. Anne K. | Removal of cystic adenoma of breast | No rise of temp. after operation. | None throughout. | R. |
| 8. Reub. B. | Amputation of thigh for chronic arthritis of knee. | Hectic fever was present at time of amputation, temperature ranging from 99° to 102.° E. temperature fell to 100° day after operation, and thence to normal by the third day. | None throughout. | R. |
| 9. Jos. C. | Amputation of thigh five weeks after compound fracture of tibia and fibula. | Temp. before operation irregular, ave. about 101°; fell on evening of operation to 97.6°, and afterwards remained normal, except on one occasion, when it rose to 100.6° for a few hours. | Small amount of healthy pus began to discharge on the sixth day and ceased on the tenth day. | R. |
| 10. G. N. | Amputation of thigh for acute disorganisation of knee-joint occurring in course of a diffuse phlegmonous erysipelas. | Temperature on third day after amputation was 103°, and remained high till the fifth day, when it fell to 99°, and then permanently to normal. | Flaps suppurated freely from the first, the pus becoming very quickly offensive; erysipelatous blush appeared on the outer side of the thigh on the second day and lasted till the fifth. | R. |

I have included this last in order that all the cases in which the dressing had been used should be mentioned; but inasmuch as the amputated limb was at the time of operation in a condition of subsiding phlegmonous erysipelas, the use of any antiseptic dressing was merely shutting the stable-door after the steed had been stolen; and I blame myself for having in a routine manner tried thus to treat a wound in tissues which were at the time of operation septic. What happened in this case would have happened whatever the method of dressing had been.

This case excepted, the results of the other nine operations seem to justify the conclusion that the wounds thus treated healed as well and as safely, and certainly more comfortably, than if they had been dressed in the ordinary Listerian way, while at the same time the trouble involved at the time of dressing was greatly reduced.

Wounds both large and deep will not unfrequently under good hygienic conditions heal without suppuration, and indeed perfectly aseptically, whether special precautions have been taken to procure this asepsis or no; but it may well be doubted if, under the conditions of ordinary cleanly surgery, so large a proportion as nine out of ten wounds would be free from some constitutional disturbance, and that six out of ten should remain absolutely free from suppuration during the time of healing.

Two preparations of the wool were used. The first was procured from Messrs. Watts & Company, Edgeware Road, and was of German manufacture, having for its name "Salicylsaure Charpie Baumwolle." The second was prepared by Messrs. Wyman & Westman, and is called "Salicylic Wool."

One caution is needed in the handling of it. It should not be tossed about, or the particles of salicylic acid adherent to its fibres being dislodged, will cause uncomfortable coughing and sneezing; this is especially the case with the English preparation.

# MIMIC OR PHANTOM ANEURYSMS.

BY

SAMUEL WEST, M.B.

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My attention was directed to this affection by the case of a man who came as a patient to this Hospital, making complaint of indefinite aches and pains. On examining his chest, I noticed under the outer half of the left clavicle an oval pulsating tumour, above which the veins were dilated, and in which a thrill was felt and a murmur audible. The tumour was of the size of a small hen's egg, though not quite so prominent as this might imply. The patient's chest was examined both before and after me by two students, both of whom reported nothing wrong; and on proceeding to demonstrate what I believed to be an axillary aneurysm, I was surprised to find the tumour with the thrill and murmur gone. The patient was allowed to rest quietly for some minutes, and was then again examined. All the physical signs returned, tumour, dilated veins, thrill, and murmur; but while under observation the tumour gradually subsided and the other physical signs decreased, until in two or three minutes all had disappeared. The experiment was repeated several times with equal success. The physical signs were, it was found, in no way affected by position of the arms, although repeated movements of the arms quickly reproduced them; but so also did any movement, even walking with the arms hanging by the side. The signs were clearly those of temporary dilatation of the axillary artery, and the case might be described as one of mimic or phantom aneurysm.

Since observing this case, I have met with several others. They are not, I believe, very rare, and probably many of the

cases of subclavian murmur which have been described are really instances of this affection.

### Case I.

*Pain, Pulsation, Murmur, Dilatation of Veins.*

Female, 37, complained of palpitation on exertion and slight pain under the left clavicle.

March 25.—The patient was well nourished, but not muscular. Under the outer half of the left clavicle was found a pulsating swelling and over it a loud systolic murmur, increased on pressure, but not depending in any way on the position of the arm, with slight dilatation of the superficial veins on that side of the chest. The murmur subsided and the other physical signs disappeared if the patient were allowed to remain quiet for a time, though they returned quickly on excitement or on moving arms. The patient had noticed this herself, and said that the same occurred also on the right side, but on that side I myself saw nothing.

May 3.—The patient was examined again, and the same phenomena observed.

### Case II.

*Tumour, Pulsation, Murmur, and Pain.*

Policeman, 35, complained of palpitation and occasional pain in the left side, which was worse when in uniform. The patient was a moderately muscular man. Under the outer half of both clavicles was a slight swelling, most marked on the left side, increased on exertion, especially after use of the arms, but independent of the position of the arms. Impulse was felt in it, and a loud systolic murmur heard over it. As the circulation became quiet, all these physical signs disappeared, but were easily reproduced both by exertion and excitement. The heart was slightly hypertrophied.

A month later the same physical signs were present. The patient was better, though he still complained of palpitation of the heart, and of coldness and pain at times in the left shoulder.

### Case III.

*Tumour, Pulsation, Thrill, Murmur.*

S. C., 46, an ironfounder, a very muscular man, who worked at times with a sledge hammer.

He complained of slight dyspepsia. Was not a nervous or excitable man.

Under the outer half of the left clavicle was a swelling as large as a small hen's egg, with thrill and loud systolic murmur. This came and went, being produced by any excitement and occasionally by muscular movement, but was not due in any way to the position of the arms. The same physical signs were noticed on the right side, but less marked.

### Case IV.

*Tumour, Pulsation, Thrill, and Murmur.*

A. T., 29, male, boot riveter, hammering all day with a 4-lb. hammer. A muscular man. Complained of pain under the right clavicle and in the right shoulder, and occasionally of feeling "a roaring," brought on by he knows not what, but not always by work. No cardiac palpitation. A passionate but not a nervous man.

Under both clavicles (outer halves) a swelling with pulsation and systolic thrill, and a loud rasping systolic murmur, increased on pressure, which disappeared if the patient remained quiet for a time, reappeared quickly on excitement, especially after movement of the arms, but was not due in any way to the position of the arms. No other physical signs.

### Case V.

*Tumour, Pulsation, Thrill, Murmur, Amyotrophy.*

W. N., 38, male, came complaining of loss of power in left arm and leg; and was found to have wasting on the left side of some of the scapular muscles, notably the infra-spinatus, and of some of the gluteal muscles, chiefly the gluteus maximus. In these regions he suffered from neuralgic pain. The cause of the wasting was obscure. The patient was not muscular, and was not accustomed to very heavy work.

Over the left deltoid and pectoral region were enlarged superficial veins, while there was a pulsating swelling under the outer half of left clavicle, with a thrill and a systolic murmur, the latter increased on pressure. The same symptom, though to a much less degree, on the right side. On both sides the murmur, thrill, and pulsation appear and disappear according to excitement and movement.

## Case VI.

*Tumour, Pulsation, Murmur, Dilated Veins, Difference in Pulses.*

W. M., clerk, 39, came complaining of debility of six weeks' duration.

Some diffuse fulness under the outer half of the right clavicle, though no distinct tumour, and over this a loud systolic squeak, increased on pressure, but audible without any pressure; affected by position; loudest when the right hand was holding up the trousers, and almost absent when the arm hung down; but in a few seconds all this disappeared, and the murmur could not be reproduced either by position or pressure.

The superficial veins were dilated on both sides of the chest. The slightest excitement brought back the symptoms afresh. On examination some weeks later, the symptoms were still present, and it was noticed that the right pulse was smaller than the left, though this difference might have been physiological.

## Case VII.

*Tumour, Pulsation, Thrill, Murmur.*

A. R., male, 20, a weakly, feeble man, came complaining of cough, and was found to have emphysema of the lungs. Under the one half of the left clavicle was a swelling, with visible pulsation and systolic murmur, which disappeared in a few minutes while under observation, though easily reproduced. The patient complained of palpitation of the heart when excited, and of being very nervous.

A month later the signs noted were: swelling as before; dilated veins at lower part of neck, and thrill; systolic blowing murmur; forcible thumping pulsation,—all subsiding as patient became quiet. Nothing similar on the right side. Systolic murmur audible above the clavicle, and faintly at the aortic cartilage.

Three months later, the same phenomena noted, except the dilatation of the veins. After subsidence they could be reproduced at pleasure.

I have seen this patient several times since, and have always observed the same phenomena, though not always in the same degree.

Synopsis of Cases.

| | Sex. | Age. | Symptoms. | Physical Signs. |
|---|---|---|---|---|
| 1 | F. | 37 | Palpitation of heart, with pain under clavicle. | Tumour on left side. Systolic murmur. Dilated veins. |
| 2 | M. | 35 | Palpitation of heart, with pain and coldness under clavicle. | Tumour on both sides, most on left. Systolic murmur. |
| 3 | M. | 46 | Dyspepsia. | Tumour on both sides, most on left. Systolic murmur. Thrill. |
| 4 | M. | 29 | Pain and "roaring" under clavicle. | Tumour, equal on both sides. Systolic murmur. Thrill. |
| 5 | M. | 38 | Pain associated with amyotrophy, and due probably to spinal lesion. | Tumour on both sides, most on left. Systolic murmur. Thrill. Dilated veins. |
| 6 | M. | 39 | Debility. | Tumour on right side. Systolic murmur. Thrill. Dilated veins. A difference in the pulses. |
| 7 | M. | 20 | Palpitation of heart. | Tumour on left side. Systolic murmur. Thrill. Dilated veins. |
| 8 | M. | ?35[1] | General aches and pains. | Tumour on left side. Systolic murmur. Thrill. Dilated veins. |

Of these eight cases, seven were males, and, with the exception of one, all in the middle period of life. They all came to the Hospital complaining of symptoms of debility or nervousness, and, in four of the cases, of discomfort in the subclavian region. Though two were muscular men, the other cases were not so, and some of them decidedly weak and ill developed.

The swelling was unilateral in half the cases, and in the other half more marked on one side than the other. A murmur occurred in all, and a thrill was noted in six. Dilated veins on the affected side in five, and in one a difference in the pulses.

In all, the physical signs were of temporary duration, though easily reproduced by any excitement, and in nearly all were unaffected by position.

The name of mimic aneurysm was given [2] by Sir James Paget in the article upon neuromimesis in his "Clinical Lectures" to the similar affection of the abdominal aorta, familiar under the name of pulsating aorta or abdominal pulsation. This has been long known (it is noticed by Hippocrates [3]), and has been often described; but in other vessels, with the exception of a brief account by Laennec,[4] and of the short reference by Sir

[1] The original case described at the commencement of this paper (p. 119).
[2] Aneurysme bâtard, Morgagni.
[3] Hippocrates, ed. Littré, v. 369.
[4] Traite d'Auscultation, ii. 765.

James Paget,[1] and a similar reference by Dr. Walshe,[2] this affection has been, I believe, hitherto undescribed.

In the abdominal aorta, the name of mimic aneurysm is fully justified, for Sir J. Paget remarks that all the cases of abdominal pulsation which came under his observation had been diagnosed as aneurysm; and this is a matter of common experience

The points upon which the diagnosis between these two classes of cases rest are thus stated by him :[3] "The artery feels full and wide, but soft and compressible, or even, if one may so call it, puffy, without any of the hardness or stiffness felt in aneurysm. The pulsation is full, but rather soft, like that of an artery in the reaction after large loss of blood; and what is chiefly characteristic of the absence of dilatation or aneurysm, the extra-full pulsation is only in one direction. There is no unusual lateral dilatation. The too-much throb is only forwards. There are no paroxysms of pain, and no growth in size. In the abdominal aorta there is no considerable dilatation. It is as if the arterial walls were thin, and had too little muscular resistance." In two cases to which he refers, in which post-mortems were made, no change beyond general thinness was found in the coats of the vessels.

In the cases I have just described many of these diagnostic points fail. The dilatation in both directions, transverse and longitudinal, the pulsation, thrill, and murmur, are all signs of true aneurysm; and so close may the resemblance often be in marked cases, that diagnosis would be difficult except for the one additional and differential fact of their temporary character.

The causes of this affection are obscure. The permanent dilatation is usually, although not always, connected with change in the coats of the vessel, and although one of the causes of aneurysm given by authors is paralysis of the vaso-motor nerves, there is, I believe, but little satisfactory clinical proof of this. Local muscular weakness alone will not explain these cases of mimic aneurysm. The true explanation must be sought in innervation disturbance,—a disturbance in which, whether primarily or secondarily, the sympathetic is at fault. The sympathetic might produce the required result by exciting contraction of the peripheral portion of the affected vessel, this being followed by secondary mechanical dilatation immediately above the

[1] Paget, Clinical Lectures. This mimicry is most frequent in the abdominal aorta, in which it has been often described as a nervous abdominal pulsation; but, so far as I know, it is not described as occurring in the subclavian, innominate, and carotid arteries, though in these it is not very rare, and sometimes is not easy of diagnosis.

[2] "Diseases of the Heart," article on Pulsating Aorta.

[3] Paget, *ut supra.*

constricted part. But only in one case was any difference in pulse noted, and this might have been physiological. It is therefore more probable that the dilatation is a primary local lesion, due either to irritation of the vaso-dilator or to inhibition of the vaso-constrictor fibres. The existence of vaso-dilator fibres is still uncertain, so that what we have probably to do with in this affection is a paroxysmal inhibition of the vaso-constrictor fibres. And we may not inaptly compare the temporary dilatation of the axillary with the temporary dilatation of the small vessels of the skin, with which we are so familiar in blushing.

The analogous physiological process is to be found in the so-called rhythmical contraction or dilatation of arteries, observed first by Schiff in the rabbit's ear, later by V. Riegel[1] in the saphena vein and in the mesenteric arteries, and by Gunning and Savrotti[2] in the web of the frog's foot. It has been described as occurring occasionally in the veins[3] and also in the lymphatics of the guinea-pig.[4]

The rhythmical contraction is irregular in its periods and duration. Schiff noticed it from two to eight times in the minute. By others the contraction has been found to last longer—from one to even ten minutes. It is independent of changes in the external temperature, of the heart's action, and of respiration. It is greatly affected by sensorial and psychical stimuli, and these reach the vessel through the sympathetic trunk, for section of these nerves stops the rhythmical movements. Schiff concluded from this that the source of these movements was situated in the nerve centres, but it has been shown since, that this cessation is only temporary, and that the movements return in a short time (a day or so) after the operation. This fact led Huizinga[5] to believe that they depended upon local centres, probably the sympathetic plexus in the vessel walls.

Rhythmical contraction has, it is stated, never been observed in the large arteries, and, so far as I know, nothing similar has been described in man.

The part which the sympathetic plays in disease is a subject of great and increasing interest. From the simple blush to the nervous palpitation of the heart may be traced, I believe, a continuous chain of analogous phenomena.

The ordinary blush, the flushing of dyspepsia and meningitis,

[1] Archiv. f. d. ges. Physiol., iv. 356; Vulpian, Leçons sur l'Appareil Vasomoteur.
[2] Utrecht, 1857.
[3] V. Riegel, *ut supra.*
[4] Heller, Verh. d. phys.-med. Soc. zu Erlangen, 1870, Heft 2.
[5] Archiv. f. d. ges. Physiol., xi. 207.

the erythema of neuralgia and the hectic of fever, are instances of sympathetic vaso-paralysis affecting limited areas of small vessels. The hyperæmic stage of inflammation, in which not only are the small arteries and capillaries of the affected part dilated, but also the large vessels going to it, supplies the link which connects these affections with the large and multiform group of inflammatory diseases. In glycosuria and polyuria a more extensive vaso-paralysis occurs, in which a whole system of vessels is concerned, the hepatic in one case, and the renal probably in the other. Mimic aneurysm and abdominal pulsation are instances of the same vaso-paralysis, but one which is limited to large vessels or parts of them, while those palpitations of the heart which are accompanied, as is often the case, by dilatation, form the last link in the long chain. Between the glycosurian group, in which the whole system of vessels is affected, and the last two groups of mimic aneurysm and nervous palpitation of the heart, the gap is filled by that more extensive and complicated sympathetic neurosis, exophthalmic goître, in which disease not only is a system of vessels affected (the thyroid and probably also the retro-bulbar), but also the larger vessels, and the heart. In goître, however, important as the part is which vaso-paralysis plays, we have a curious entangling of vaso-paralytic and vaso-spastic phenomena, which our present knowledge of the sympathetic system does not permit us to unravel.

The series of cases under consideration may be completed by adding those instances of dilatation of the abdominal vein, which constitutes probably the pathology of fainting and shock.

It would be interesting to consider how far temporary vaso-paralysis might explain certain obscure neuroses, such as hemicrania, angina pectoris, convulsions, epileptic and hysterical fits, and what part it might play in many other affections; but such an inquiry would be beyond the limits of the present paper.

# REMARKS ON ANGINA PECTORIS

*(Continued).*

BY

VINCENT HARRIS, M.D.

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In continuation of a short paper which appeared in the "Hospital" Reports[1] for last year, I wish to add one or two observations, principally concerning the pathology of angina pectoris.

In the paper referred to it was shown, that as authors differed so much in their accounts, both of the symptoms and of the frequency of what they called angina pectoris, in all probability they are describing either distinct affections or several varieties of the same condition. In coming to this conclusion, it was necessary to mention in passing the ideas about the pathology of angina pectoris held by the chief writers on the subject, but a more complete review of the pathology generally was reserved until another occasion. We must remember at the outset that any ideas which may be, or may have been, advanced about angina pectoris are of necessity to a high degree speculative, as, after all, the term is only one applied to a group of symptoms; and of these symptoms the chief is (according to Latham's definition) the subjective one of *pain*. *Pain*, as a symptom, is of variable significance, in some cases meaning much, in others next to nothing. In this affection we have no exact means of estimating it, and therefore, as to a great extent our ideas as to the causation of the paroxysms must depend upon a correct estimation of the anginal pain, it is not strange that the pathology of the affection still remains doubtful. In true angina pectoris, the pain is of the very severest character, and is localised by Dr. Latham[2] to "the chest from the sternum to the spine." It arises suddenly and ceases suddenly, "and is accompanied while it lasts with a feeling of approaching death." The main theories which have been brought forward to explain

[1] St. Bartholomew Hospital Reports, vol. xv. p. 85.
[2] Subjects Connected with Clinical Medicine, vol. ii.

the phenomena of the seizure are the following : (1.) That the affection is due to a spasm of the heart; (2.) that the prime cause is essentially nervous ; (3.) that the paroxysmal pain is due to dilatation of the heart.

1. Dr. Latham takes very great pains, in his account of angina pectoris, to show that Heberden had no doubt that the symptoms were due to *spasm of the heart*, and he quotes no less than eight distinct reasons from Heberden's original article in favour of this view. Of these, the most important are : that the attacks come and go suddenly ; that there are long and complete intermissions between them ; and that the pulse is unaffected during the very height of the disorder. Dr. Latham[1] apparently took the same view of the causation of anginal paroxysms as Heberden ; and nearly all the subsequent writers, while denying the possibility of spasm as a cause, have acknowledged the element of neurosis in the affection. Dr. Walshe suggests that no doubt the vagus and sympathetic filaments distributed to the heart are the nerves implicated (*vide infra*). Heberden did not, it appears, examine the bodies of more than one of the hundred cases which he claims to have seen ; in this one, "a very skilful anatomist could discover no fault in the heart, in the valves, in the arteries or neighbouring veins, excepting some small rudiments of ossification in the aorta.[2]

It was not until some time after Heberden's first paper was published that the frequent connection of ossified coronary arteries and fatty heart with angina pectoris was demonstrated by Jenner. It is unlikely that a fatty heart can enter into spasm sufficient to cause such extreme lancinating pain as occurs in these paroxysms. It has been shown by Walshe,[3] that to produce an acute attack of pain it would be necessary for the spasm to occur in a strongly hypertrophied heart. Stokes[4] also in the most emphatic way denies the possibility of accounting for angina pectoris in Latham's way. He says :—

"Bearing in mind that the heart may be considered as a hollow muscle, it is difficult to understand how such a general or local spasm could occur as would only impede and not destroy its function ; for a complete spasmodic closure of any one cavity ought to cause death by breaking the continuity of the circulation. In such a case, too, we might expect to find after death that the heart or a portion of the heart was firmly contracted on itself. Yet, so far as I know, such a condition has not been

[1] Latham, loc. cit.
[2] Commentaries, 2d ed., p. 368.
[3] Diseases of the Lungs, Heart, and Aorta, 2d ed., p. 579.
[4] Diseases of the Heart and Aorta, p. 485, Dublin, 1854.

found in persons who have died in a paroxysm of angina. Little as is known of spasm of the heart, that little is opposed to the idea of angina pectoris being produced by it. I have already noticed the spasmodic contraction of the heart in tetanus, and in such cases the symptoms of angina were not observed."

The opinion that ossification of the coronary arteries is present in most cases of angina pectoris, although supported strongly by Parry and many subsequent physicians, was strongly combated by Lænnec,[1] who, however, seemed to consider any pain in the chest true angina pectoris; he stated that Parry's view was "far from being correct." Lænnec[2] considered the affection a pure neuralgia, and was supported by Desportes[3] in this notion. It is very interesting to find that this author, however, found in certain autopsies marked dilatation of the heart, "but in none were the coronary arteries ossified." It is, however, a well-established fact that in very many cases ossification of the coronary arteries and its sequence, fatty heart, are found in patients who have died in an anginal paroxysm. It will be seen, therefore, that Heberden's view, that the whole group of symptoms are due to spasm, cannot be altogether received, although we may be ready to admit with Gairdner that certain of his cases might possibly have been due to that cause and nothing more.

2. Touching the belief of Lænnec, mentioned above, that angina pectoris is a *pure neurosis*,[4] I have endeavoured to show that his views are scarcely to be entertained, as under the head of angina pectoris he included such neuralgia as we call pleurodynia, cardialgia, gastralgia, &c. I also showed that pain running down the inside of the left arm is a very frequent symptom of dyspepsia. During the past year, in the many thousand cases of dyspepsia I have seen in the Casualty Department of St. Bartholomew's, I have been able to confirm this statement—about one patient in six or seven suffering from pure dyspepsia either complaining of this symptom, or on inquiry giving it as not uncommon. It is very strange, however, that this opinion of the pure neurotic origin of angina pectoris was held to a certain extent by Hope, one of the most able writers on the subject. He says: "According to my own observation, it may originate in any cause, whether organic or functional, capable of irritating the heart, or of rendering it morbidly susceptible of irritation; and as structural disease of the organ has this effect more than any other cause, it is that on which the malady is most frequently dependent." But Hope agrees with Lænnec in stating that the morbid lesion most frequently found in fatal cases is dilatation

[1] Lænnec, Diseases of the Chest, trans. by Forbes.
[2] Loc. cit.
[3] De l'Angine de Poitrine, 1813.
[4] Loc. cit.

and not contraction of the heart. The likeness of attacks of angina pectoris to epilepsy is occasionally very marked. The warning is sometimes like the *aura* of *bona fide* epilepsy. The patient of mine whose case I recorded in my last paper told me that he *invariably* had peculiar warnings of an oncoming attack. The sudden pallor of face, too, succeeded by flushing, which is so marked in epilepsy, was well marked in the same patient.

Trousseau[1] was, I believe, the first to point out this. He says that the pain may begin in the arm and subsequently radiate to the throat, attack the præcordial region, and bring on a sense of anxiety. But this author goes even farther, and regards the nervous element as sometimes quite independent of organic lesion, although organic lesion be present. He calls the disorder *epileptic neuralgia*. As regards the term *neuralgia*, however qualified as applied to a case of typical neuralgia, Dr. Gairdner[2] believes it to be "partially admissible, viewing the disease from the side of the pain alone; but it errs both by excess and by defect, inasmuch as, on the one hand, pain of the severe form implied by the term neuralgia is not always the central or exclusive phenomenon, even in cases ending in sudden death; while, on the other hand, a form of cardiac pain, or *pseudo-angina* (as it has been termed), is not infrequent, which has most of the attributes of a neuralgia in the highest possible degree, and which, though eminently paroxysmal, is by no means apt to lead to sudden death, or to any grave consequences whatever."[3] The same author has ably shown that angina pectoris cannot be a *pure* vaso-motor neurosis, as stated by Nothnagel.[4]

In connection with this view of the purely neurotic origin of angina pectoris, we come to the most important observations which have hitherto been made on the condition—viz., those of Dr. Brunton. These researches, which we shall give in some detail, are thought by some physicians to set at rest for ever the inquiry into the pathology of the condition.

Few observations have been made upon the pulse during an anginal attack by any of those writers who have specially interested themselves in the subject. Heberden makes the very astounding statement, as we have seen above, that the pulse was unaffected in his cases. Latham mentions the pulse only casually. Dr. Brunton's observations upon the conditions of the pulse in a case which, he says, "from the absence of a sense of impending death might be reckoned as one of *pseudo*-angina, but in the intensity of the pain and the manner of its radiation more

[1] Trousseau's Clinical Med., New Syden. Soc. Trans., vol. i. p. 65.
[2] Reynold's Syst., vol. iv. p. 511. [3] Loc. cit., p. 599.
[4] Deutsches Archiv. für Klinish. med., Band III. xiv.

closely resembled *true* angina—as cardiac lesion was present, it belonged to the class *organic* angina"—showed that in that case there was increased blood pressure. He proved that this increase of the blood pressure was due to a spasmodic contraction of some, if not all, of the small systemic, and probably of the pulmonary arterioles, and he concluded that this was probably due to "a derangement of the vaso-motor system, and accompanied by a derangement of the cardiac regulating apparatus, producing quickened instead of slower pulsation." In a case which I have recorded, I found the pulse, when taken during a paroxysm, amounted to 104 beats per minute; and although I was unable to take a tracing at the time, there is no doubt that the tension was above normal; this patient suffered from aortic valve (ruptured) disease. No doubt many other observations have been made confirming Dr. Brunton's facts. Having found in *nitrite of amyl* a drug which diminished arterial contraction, Dr. Brunton applied it with success in the above-mentioned case—the arterial tension diminishing and with it the anginal pain. The same investigator showed that other agents which diminished blood pressure, *e.g.*, blood-letting, also diminished the pain; and those which increased the blood pressure, *e.g.*, digitalis and aconite, also increased the pain. Since these most excellent results were obtained, *nitrite of amyl* has been used over and over again in cases of true and false angina with success. Without going into the apparent anomalies of the first recorded case, as Dr. Gairdner has done, which do not, it seems to me, interfere with the result, one cannot but agree with this writer when he says that "further observations seem to be required before it can be safely assumed that either the vaso-motor derangement, on the one hand, or disorder of the cardiac innervation, on the other, is the primary or essential phenomenon of true angina pectoris."

Although a very great number of cases yield to the influence of nitrite of amyl, some do not; and it is these cases which suggest that the pathology still wants clearing up. In addition to this, there is a point which might be made much of, as to whether the drug acts solely by dilating the arterioles. Dr. Brunton[1] dismisses somewhat shortly the possibility that the diminished action was due to a lessened power of the heart. The great importance of relieving the increased arterial tension, however, has lately been further shown by Dr. Murrell.[2] He has experimented with nitro-glycerine, which he showed to have much the same action on the pulse as nitrite of amyl; and

[1] Action of Nitrite of Amyl on the Circulation. Journal of Anatomy and Physiology, vol. v.

[2] Lancet, 1879.

applying his experiments therapeutically, he finds the paroxysms of angina thereby much relieved.

3. As regards the question as to whether or not the paroxysms are due to *dilatation of the heart*, we are able to cite a great many authorities who believed this, and others, such as Lænnec and Hope, who, although they did not connect this condition with the symptoms, nevertheless were bound to note the great frequency of the post-mortem appearance of a dilated and flabby heart in death in a paroxysm of angina.

According to Dr. Parry,[1] angina pectoris is an example of syncope preceded by a notable anxiety or pain in the region of the heart, the result of some lesion which acts in diminishing the energy of the heart. He traced the symptoms to a retardation and accumulation of blood in the cavities of the organ. Parry,[2] who, as before mentioned, was the first to bring into prominence Jenner's view of the connection between the ossified coronary arteries and fatty heart with angina, further pointed out the unlikelihood of the implication primarily of the vagus, as there is no dyspnœa and no marked palpitation. He exposed the fallacy that patients cannot or will not breath during an attack (which has been reasserted by Eulenberg), but showed, with Heberden, that a deep inspiration gives a momentary relief to the sensation in the chest, no doubt by pushing on the lagging blood-stream.

Stokes sums up the matter by observing that "angina pectoris is but the occurrence, in a defined manner, of some of the symptoms connected with a weakened heart." And Quain has shown that ossification of the coronary arteries causes angina only because it causes fatty degeneration and atrophy of the heart muscle, and puts the organ in a condition in which it is liable to dilate.

Many other authorities might be mentioned who hold the view that *dilatation* of the heart is an essential in true anginal spasm, and it seems probable that this view is correct from the following reasons :—

(1.) That the heart is very often, at all events, in just the condition for dilatation, being atrophied from fatty changes in connection with ossification of the coronary arteries.

(2.) That the rapidity of the pulse during an attack, which may be taken to mean increasing dilatation of the heart, and so weak and rapid action, until a condition ensues which either ends in death, or from, as it were, an extra vital effort, recovery. The increased blood-pressure may not be an essential

[1] Quoted by Stokes, loc. cit.
[2] Symptoms and Causes of Syncope Anginosa, 1799.

in the paroxysm, and if it is, it may be due to a *secondary* stimulation of the vaso-motor centres in the medulla or spinal cord, directly or reflexly producing increased arterial tension.

(3.) That the heart after death is almost invariably found in a condition of dilatation.

Supposing the dilatation of the heart to be an essential in the causation of the anginal seizure, the question arises whether the increased arterial tension is merely accidental or secondary, or whether it is equally or even more important than dilatation in producing the paroxysm. As we have mentioned above, some physicians strongly hold to this latter view. They may or may not be correct, but, in all fairness, we must altogether decline to believe with them further that dilatation of the heart occurs accidentally and has nothing whatever to do with the causation of the affection.

*The pain* in anginal paroxysms is believed by all the writers who regard it as a symptom of heart disease to be due to irritation of the cardiac nerves. These nerves would be especially likely to be involved in cases of ossification of the coronary arteries, as they are in close proximity to the cardiac nerves throughout their whole course; for these nerves not only accompany the arterial trunks, "but pass into the muscular parietes of the heart along with the coronary vessels, and the nervous filaments can be traced as far as the third or even the fourth subdivision of the arteries. Here we lose sight of them even in the hearts of the largest animals" (Bichat). The pain radiates in severe cases through the connection of the cardiac plexus with the spinal nerves to the brachial and cervical plexuses.

ON

# THE PRESENT STATE OF OUR KNOWLEDGE IN REGARD TO FERMENTS.

BY

D'ARCY POWER.

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## *The Introduction.*

Such rapid progress is being made daily in all departments of science, that it is almost impossible for those who are not actually engaged upon work in the various subjects to attain to an adequate knowledge of the most recent advances. In no case is this better exemplified than in the department of biology, and more especially in that part which deals with the ferments. It is only necessary to turn to such a record as "the list of recent papers" appended to the "Journal of Physiology," to find that several pages are there devoted to a bare record of the titles of papers which have been published during the last two years upon this ever-growing subject. With such a literature it is well, not only in the interest of the general reader, but also as a starting-point for future investigation, to review the present state of our knowledge, and to consider what lines have yielded the richest harvest of results. Before proceeding to do so, however, I would preface, with Burton, that "I have collected this cento out of many writers, wronging none," and must usurp that saying of Wecker, "Nihil dictum quod non dictum prius, methodus sola artificem ostendit."

## *The Importance of a Knowledge of the Ferment Processes.*

The subject of fermentation is one of great practical importance, and the utility of an accurate knowledge of the circumstances under which it takes place, and of the phenomena which accompany it, are now recognised not only by the physician and

chemist, but even by the brewer and wine-grower. The classical researches of Pasteur upon yeast, and of Brown and Heron upon the conversion of starch into sugars, have of late years given a scientific aspect to the trades of brewing and wine-making.

### *Abuse of the Term Ferment.*

In pathology as well as in physiology great use has recently been made of the term ferment to explain a variety of processes which appeared to be incapable of explanation upon any known theory; and it appears but too probable that owing to such an indiscriminate and unscientific use of the phrase the ferments will attain to the unenviable position which has hitherto been occupied by the vital principle. It is indeed of interest to notice that Van Helmont, a physician living in Germany at the beginning of the seventeenth century, held that the vital principle was identical with a ferment; for, to use his own words, he believed that "water was the true principle of all existing things, and that the archæus drew all bodies from water, to which its generating spirit was attracted by the odour of a ferment or aura vitalis." The ferments, or at least one group of them, labour under the same disadvantage as the vital spirit, inasmuch as they possess no distinct entity, and consequently cannot be directly tested for, so that their existence or presence can only be inferred by the results to which they give rise.

### *Origin of the Term.*

The term ferment, like many of the scientific expressions in our language, is derived directly from the Latin, the word *fermentum* clearly originating in the phenomena presented during yeast fermentation, when the escape of carbon dioxide leads to a *boiling* (*ferveo*) appearance. The word is, however, applied indiscriminately to a number of other phenomena which are only now beginning to be separated. The yeast ferment, as we know from the Vulgate, was in common use at a very early period; whilst Pliny, in his great work on natural history, alludes to the practice prevalent in Gaul and Spain of obtaining yeast or fermentum from the scum which gathers on corn that has been mashed for making drinks; a practice which is corroborated by Virgil[1] in his third Georgic, as well as by Celsus. During the Middle Ages great use was made of the term "ferment" by the alchemists. Petrus Bonus in the fourteenth century, and Basil Valentine about 1400, drew attention to the extraordinarily small

[1] "Et pocula læti
Fermento atque acidis imitantur vitea sorbis."

quantity of yeast which was required to set up very great changes in a large mass of material; whilst Rippel two centuries later regarded the philosopher's stone itself as similar in action to a ferment.

### *Theories of Fermentation.*

From time to time various theories have been promulgated to account for the action of ferments, but in no case has a wholly satisfactory explanation of all the phenomena been afforded. *The physical theory* of Willis, although long since discarded, is of interest as being the first philosophical theory of fermentation, in which a distinction was drawn between the phenomena produced by the action of yeast on solutions containing sugar, and those which are observed when an acid is brought into contact with an alkali. This hypothesis assumes that yeast, and in general all decomposing animal and vegetable substances, will communicate to other bodies whose component molecules are in a state of feeble combination that condition of decomposition in which they are themselves placed. In other words, the motion which is given to the elements of the fermenting body by the disturbance of equilibrium is also communicated to the elements of the bodies which are in contact with it. This theory was accepted by Stahl, and at a later period by Liebig; but it will be readily seen that it rests upon a confusion of the fermentative with the putrefactive process—an error into which Libavius had previously fallen. Another explanation, which is similar in many respects to the previous one, is known as *the mechanical theory* of fermentation, also introduced by Willis. The ferments, upon this hypothesis, are substances whose molecules are in a state of rapid vibration, the vibrations are communicated to the molecules of the fermented body, but being dissonant, the molecules composing the latter fall down or are rearranged, new compounds being thereby produced, whilst certain forms of energy are liberated. During the early part of the present century Berzelius proposed his *catalytic theory*, to the effect that ferments act by causing a rearrangement in the molecules of the fermented substance, being themselves unchanged. In explanation of his meaning he adduced as an analogous instance the decomposition of hydrogen peroxide when brought into contact with platinum in a finely divided state. These theories, though at once elaborate and ingenious, are now abandoned as untenable, and have given place to the following more recent and at the same time more comprehensible explanation of a large number of fermentative changes. *The vitalist theory* has become associated with the name of Pasteur, and it asserts that the decomposition of such a substance as

sugar is due to the nutrition and development of certain organised bodies. This doctrine, which has been rapidly gaining ground during recent years, was aptly summed up by Turpin in 1838 under the formula, "Fermentation as effect and vegetation as cause are inseparable, and result (in the example selected) in the decomposition of sugar." It is but right to state, however, that this explanation applies only to that single class of the ferments to which the term morphological has been applied, and that the last work of Claude Bernard led him to oppose it.

### *Varieties of Ferments.*

The ferments are divisible into two great classes—the organised, particulate, physiological, morphological, formed or insoluble ferments, which are low forms of vegetable life such as the yeast plant; and the unorganised, diffused, chemical, non-morphological or soluble ferments, such as the majority of those existing in the animal and vegetable organisms.[1] Of the latter class, pepsin and diastase may be taken as types. Organised ferments, as has already been shown, were known to the ancients; the unorganised, however, have only been recognised so recently that Theodore Schwann, who first isolated pepsin, the active principle of the gastric mucous membrane, in 1836, is still a professor at Liège; whilst Claude Bernard, who died comparatively young in 1878, first drew attention to the influence of the pancreas on food materials.[2] The two classes of ferments are broadly divided from each other by obvious differences. Thus the morphological ferments, being protophytes, may be distinguished by a variety of means, and to this class alone is applicable the vitalist theory of which we have already made mention. The non-morphological group, to which the term *ferment* should properly be confined, can only be detected by the results which they produce, since, as their name implies, they have neither shape nor form; they have no power of reproduction, they do not increase in bulk during the fermentative process, and they are in every case the product of secreting cells.

### I. The Morphological Ferments.

The organised ferments, which, as Robin has shown, are in every case of a vegetable nature, are divisible into several

[1] To this class of soluble ferments Kühne has applied the term *enzymes;* they are also known to French writers as *the zymases.*

[2] De Graaf in 1662 and Eberle in 1838 had, however, previously alluded to the function of the pancreas in the digestion of fats, whilst Purkinje and Pappenheim in 1836 found that this gland digested proteids.

smaller classes, each of which can be referred to one or other of two main groups, according as the results of the fermentation are of a bland or disgusting nature. Of these two groups, the first comprises the ferments belonging to the yeast plant type, which set up changes in various substances, the resulting products being for the most part of commercial value. To this group belong the alcoholic, viscous or mannitic, and acetic acid fermentations, each of which we shall briefly consider, beginning with the alcoholic, as being at once the commonest form, and the one which has been studied the most carefully.

### *Alcoholic Fermentation.*

The active agents in the alcoholic, as in all other fermentations belonging to this class, are small plastids or unicellular organisms, discovered by Leeuwenhoek in 1680, though their vitality was only demonstrated by Fabroni in 1787. The organisms have since been the subject of repeated and careful investigation, with the result that they are now grouped under the title of Saccharomycetes, and are classed amongst the protophytes or lowest forms of vegetable life. The plastids multiply rapidly by a process of exogenous gemmation, and aggregate themselves into chains, which form, in the case of the yeast plant (Saccharomyces cerevisiæ and ellipsoideus), the well-known torula chains. During the growth of these chains large quantities of carbon dioxide are set free, whilst there is a considerable absorption of oxygen. M. Pasteur believes that the oxygen is obtained from the air in the case of the plastids, which float upon the surface of the liquid, whilst it is derived from the surrounding media by the submerged yeast. It thus appears that the yeast plant and its allies possess the faculty of breaking up various stable compounds, and more especially grape-sugar, to obtain the necessary supply of oxygen. In thus abstracting the oxygen, the molecule of sugar or other substance is broken up, and the constituent atoms rearrange themselves in the example selected into molecules of ethyl alcohol and carbon dioxide, traces of glycerin and succinic acid being at the same time produced. This theory has, however, recently been disputed, on the ground that if such a decomposition really occurred, ethyl hydrate, and not ethyl alcohol, would be formed. Alcoholic fermentation does not, however, appear to be entirely dependent on the growth of the yeast plant, or of any organism nearly allied to it; for Pasteur has shown that all vegetable cells have the power of producing alcohol and carbon dioxide at the expense of sugar, although in such cases the action is much less energetic than with yeast.

The means whereby the sugar molecule is broken down, and the mode in which the disintegration is effected, has given rise to a variety of speculations, none of which afford an adequate explanation of all the phenomena. The theories which have been put forward on this subject are divisible into two classes, viz., those which explain it on chemical grounds and those which afford a biological interpretation; but, as has been already stated, it appears best to adopt for the present the vitalist theory, and we must then assume that the phenomena are fundamentally biological in their character, and are explicable solely according to biological laws. It is to be remarked that the amount of yeast produced during fermentation bears no relation to the amount of sugar which disappears, but is within certain limits directly proportional to, whilst the quantity of alcohol produced varies inversely as, the consumption of free oxygen, and that when yeast is deprived of sugar it undergoes a singular change, which appears to be due to the yeast fermenting itself. In this case, as well as in yeast deprived of oxygen, it is found that the ferment action is reduced to a minimum, but that, on the addition of a saccharine solution, the fermentation gradually becomes stronger. From these and other considerations which it does not appear necessary to consider here in detail, it has been supposed that the yeast plant may contain within itself an unorganised ferment which is used up as rapidly as it is formed. The investigations as to the existence of this soluble yeast ferment occupied the last days of the life of Claude Bernard, and the recent publication of his unfinished manuscript has given rise to a considerable discussion on the subject, Cochin having come to the conclusion that no such ferment exists. Two forms of alcoholic fermentation are in ordinary use; in the first, known as the English or top method of brewing, the wort is fermented at about 65° F., and the process is completed in a week. In the second or bottom form, practised by the Bavarian brewers, the fermentation occupies nearly six weeks, since it proceeds at a much lower temperature (45° to 50° F.). In the latter process the yeast, instead of separating on the surface, sinks to the bottom and carries down with it every particle of glutinous matter, which, if kept suspended in the beer, would render it liable to acetic acid fermentation. Bavarian beer manufactured in this way is richer in sugar and dextrin, as well as in flavour (oil of hops), than English beer, but it contains much less alcohol. Pasteur believes that the top and bottom yeasts are distinct species, and that they may be distinguished one from the other by their appearance.

### *Acetic Acid Fermentation.*

The acetic acid fermentation depends, as its name implies, upon the formation of acetic acid at the expense of alcohol. The change can be brought about by chemical as well as by biological means, and is essentially a process of oxidation, the alcohol being first converted into aldehyde, and then at once oxidised into acetic acid. This result is in many cases effected by the growth of the vinegar plant or mycoderma aceti, whilst in others it is obtained by bringing alcohol into contact with spongy platinum. The two processes differ, however, in this respect, that with the platinum the change takes place more rapidly if the alcohol be concentrated, whilst with the mycoderma the strength of the alcohol should not exceed 2 per cent. of the solution. The explanation of this difference is doubtless to be found in the fact that the living protophyte has its protoplasm destroyed by immersion in strong alcohol. The action of the mycoderma in effecting the oxidation is not simply mechanical, like that of the platinum black, since its power is destroyed by temperatures above 95° F. and below 50° F.; whilst it acts when it is in direct contact with the air, but not when it is immersed. It also requires as food phosphates and albuminous substances.

### *Viscous Fermentation.*

The viscous or mannitic fermentation takes place in cane-sugar, which is thereby transformed into mannite and carbon dioxide. Like the preceding fermentations, this change is effected by the growth of a protophyte consisting of a number of small and separate granules. M. Baudrimont, however, believes that the sugar itself does not undergo any transformation, but that the mannite is due to the great development of the ferment. This view of the subject appears scarcely tenable.

### *Gallic Acid Fermentation.*

Von Tieghem has shown in a series of investigations upon a subject to which but little attention had been recently paid, that Penicillium glaucum and Aspergillus niger, two forms of fungi, possessed the power of transforming during their growth tannin into gallic acid. This fermentation does not take place if air be excluded, neither is it due, as Pelouze and Liebig imagined, to a simple process of oxidation.

### *Fermentation caused by Bacteria.*

The second great group of organised ferments are the Schizomycetes or Bacteria, organisms which are allied to the Sac-

charomycetes, of which we have already spoken. The products of the growth of these protophytes are as a rule characterised by their very disgusting odour, and give rise to what are commonly known as putrefactive changes.

### *Lactic Fermentation.*

The lactic fermentation consists in the transformation of grape, milk, or invert-sugar[1] into lactic acid. MM. Boutron and Fremy were the first to draw attention to this phenomenon as a form of fermentation, and it has recently been considered in detail by Professor Lister. The latter observer has come to the conclusion that the souring of milk, the most usual example of the lactic fermentation, is dependent upon the growth and reproduction of the bacterium lactis, a minute organism which is characterised by the fact that it is motionless, and that it refuses to grow in Pasteur's solution. Pasteur, however, believes that lactic acid fermentation is due to a mould—oidium lactis—which grows upon the milk; but although this may be the case to a certain extent, the mould is not the main agent in producing the fermentation.

### *Butyric Acid Fermentation.*

After the conversion of the sugar into lactic acid, the bacterium lactis is replaced by other forms of the Schizomycetes—the vibrio and bacillus subtilis—which possess the power of carrying the lactic acid fermentation beyond its normal limits and producing the butyric acid or true putrefactive compounds. All bodies capable of undergoing lactic acid fermentation are liable to be thus transformed into members of the butyric acid series; and it is probable that the same bacteria would carry on the alcoholic fermentation, were it not that the alcohol already present precludes to a certain extent any form of putrefaction, and thus acts as an antiseptic by destroying the bacteria.

### *Cellulose Fermentation.*

The cellulose fermentation is said by Mitscherlich, whose observations have recently been confirmed by Van Tieghem, to depend upon the development of a peculiar form of bacterium —B. amylobacter. This organism possesses the remarkable property of dissolving cellulose and of causing it to ferment with the evolution of carbonic acid gas if the solution be acid. It would be interesting to ascertain whether the bacterium, which is of the bacillus species, exists in the intestines of those animals

[1] Invert-sugar is obtained by boiling cane-sugar with dilute sulphuric acid.

which we know to be capable of digesting this substance, for it has been shown that in such cases the part where more or less of the cellulose is lost is limited by the duodenum above and the cæcum below.

### *Eremacausis.*

Eremacausis, or the process of nitrification, is brought about, according to Schloesing and Müntz, by a special form of bacterium constituting the nitric ferment, which lives in the earth, and, like other members of the order, is destroyed by the various antiseptic agents in common use.

### *Other Fermentations Produced by Bacteria.*

The Schizomycetes also bring about the succinic acid, glycerin, and hydrogen sulphide fermentations, possibly also the process by which the normally acid urine is made to become alkaline, whether the change takes place within or outside the body is effected by some members of the same group of organisms. The researches of Kühne, as well as those of Chiene and Cossar Ewart, who have shown that bacteria exist in the alimentary canal during health, prove that these bodies exert a considerable influence upon the digestion of the albumins, which is carried on by them to the formation of leucin, tyrosin, and indol, the ultimate products of proteid decomposition. When peptone is treated with trypsin, a portion—antipeptone—is always left unaltered; and if this residue be treated with fresh quantities of trypsin, no more leucin and tyrosin are formed; if, however, the solution is inoculated with bacteria, tyrosin is soon produced, as well as indol, which is readily recognised by its penetrating and fæcal odour. Kühne, too, has demonstrated that indol is never formed in pancreatic digestions except when bacteria have obtained access to the digesting solutions, and that gelatin when digested with trypsin gives rise neither to leucin nor tyrosin, though both these substances rapidly appear in presence of bacteria.

### *Theory of Action of Bacteria.*

Hoppe Seyler, in attempting to account for the action of the Schizomycetes upon various substances, has been led to conclude that they contain a special unorganised ferment, which, however, he supposes to be present in others of the lowest organisms capable of producing putrefaction, as well as in the organs of the higher animals, and probably also in plants. This hypo-

thesis is based upon the fact that the fermenting power of bacteria is not lost when an aqueous solution of them is shaken up with ether, although all living organisms are thereby destroyed. A temperature of 130° F. destroys the ferment thus isolated, which appears to be insoluble in water, and to be incapable of diffusion through animal membranes or dialysing paper. If the existence of this ferment, as well as that of the soluble yeast ferment, be satisfactorily determined, we should have the interesting fact that in each of the two great groups of the organised or morphological ferments the fermenting action was in reality dependent upon one of the non-morphological type.

## II. Non-Morphological Ferments.

Our knowledge of the soluble ferments, as has already been pointed out, is of much more recent date, whilst it is much more indefinite than our knowledge of the insoluble ferments. This group contains nearly all the ferments found in animal and vegetable organisms, the chief being the various digestive ferments, the glucoside ferments, and the ferments contained in muscle, blood, and urea, as well as the purely vegetable ferments. The members of this group agree in the following points:— They are all soluble in water and glycerin; they are diffusible with difficulty through animal membranes; they are capable of passing to a greater or less extent through porous earthenware by a process of filtration under pressure; and, finally, every soluble ferment is rendered permanently inert by exposure to a temperature of 100° C., or when in solution to a heat of 71° C.

### *Digestive Ferments.*

The digestive ferments form at once the largest and most important group of the non-morphological ferments occurring in both the animal and vegetable kingdom; they comprise the amylolytic, the proteolytic, the invert, milk, and fat digesting ferments.

### *Amylolytic Ferments.*

The amylolytic ferments possess the power of converting starch into various forms of grape-sugar and dextrin, a transformation to be presently considered in detail. These ferments are very widely distributed, the best known being those found in mammalia, viz., ptyalin, amylopsin, the glycogen ferment from the liver, and ferments which can be isolated from the gastric and intestinal mucous membranes of the dog and horse whilst in vegetables, diastase and maltin stand pre-eminent.

### *Ptyalin.*

Ptyalin occurs in the saliva, and was one of the first of the digestive ferments to be isolated, its action on starch being pointed out by Luchs as early as 1831. In man, the pig, guinea-pig, and rat this ferment exists in the secretion of both the submaxillary and parotid glands; in the rabbit the submaxillary saliva contains but little ferment, whilst in the dog the parotid saliva has scarcely any action upon starch. In the horse, sheep, and ox the amylolytic power of the saliva is very feeble. A ferment resembling ptyalin has been isolated from the salivary glands of the frog. According to Dr. Brunton, the action of saliva upon starch is not instantaneous, but takes an appreciable time to effect any change in the constitution of the starch molecule. In opposition to the ideas held by the older writers, it has recently been shown that the saliva of new-born children contains an active amylolytic ferment, which is, however, only present in minute quantities, starchy foods not being digested until the sixth or seventh month.

### *Amylopsin.*

Amylopsin is the term applied by M. Defresne to the amylolytic ferment which exists in the pancreas, whose action is more energetic than any other ferment, with the single exception perhaps of maltin. It has the power of converting starch rapidly, and glycogen more slowly, into forms of grape-sugar.

### *Diastase.*

The amylolytic ferment existing in vegetables is known as diastase; it is the chief means by which the food stored up as starch is converted for the use of the plant into the more soluble and consequently more useful sugar. Diastase has been detected in a number of plants, but the most common example of its power occurs in the operation of malting. In this process barley is forced to germinate, and the ferment which is thereby produced converts the starch of the grain into maltose, a form of grape-sugar; when the desired result is obtained, the further development of diastase is stopped by raising the grain to a high temperature, the resulting product being known as malt. The *sugar maltose*, which is the product of diastatic fermentation, differs from ordinary grape-sugar in possessing a greater power of rotating the plane of polarised light, and a diminished power of reducing copper salts.

### *Maltin.*

Siebold states that the active principle of malt is maltin, which is 200 times stronger in its action on starch than diastase. One part of pure maltin will convert 200,000 parts of starch into dextrin and sugar under suitable conditions. This remarkable and powerful substance can be obtained by macerating ground malt with lukewarm water, filtering, and precipitating with a solution of tannic acid.

### *Differences between Ptyalin and Diastase.*

Diastase differs from ptyalin, according to M. Defresne, in several important particulars. Thus he finds that the salivary ferment, though paralysed in pure gastric juice, continues active in mixed juice, which only contains organic acids; whereas diastase and maltin are irrevocably destroyed by solutions of hydrogen chloride, and by pure gastric juice, being so profoundly altered by the mixed juice, that though they may still dissolve starch, they no longer possess the power of converting it into sugar.

### *Liver Ferment, &c.*

An amylolytic ferment, which is capable of converting glycogen into sugar, has been obtained from the liver, the various tissues, and somewhat doubtfully from the blood. So widely indeed is it distributed, that M. Lépine states that he has isolated it from every tissue in the body with the single exception of the lens. Seegen and Kratschmer have found that the albuminous tissues of the animal body, as well as other albuminous substances which are soluble either partially or entirely in water, exert a saccharifying action on glycogen with which they have been left in contact for a longer or shorter time. The minutest quantities of soluble albumin are sufficient to exert this sugar-forming action, which does not, however, take place unless water be present. The amylolytic action is momentarily suspended by boiling the aqueous solution of the albuminous bodies, but it reappears again after the lapse of two or three days.

### *Rationale of Amylolytic Fermentation.*

When starch paste[1] or glycogen is digested with one of the amylolytic ferments, a certain proportion equivalent to about one half of the amount which should theoretically be formed

[1] Made by boiling starch for ten minutes in an excess of water and then filtering.

if the whole of the starch present were to be transformed into sugar, is converted into a form of grape-sugar. In the case of ptyalin the sugar formed is *ptyalose*, whilst the resulting product of diastatic fermentation is, as has been already stated, *maltose*. In no case does a normal amylolytic digestion terminate with the formation of grape-sugar. If, however, either maltose or ptyalose be treated with hydrogen sulphate, true grape-sugar is formed. On the other hand, if starch be treated with the same acid, 99 parts of starch will yield 108 parts of glucose. The conversion of starch into sugar, whether such transformation be brought about by means of a ferment, or by a dilute acid at a high temperature, is effected through the intermediation of certain stages. The first change that is observed during this process is the transformation of the stiff starch paste into a watery liquid, in which state it is known as amidulin or soluble starch, and the formation of this soluble starch is, according to Dr. Roberts, the chief function of the salivary secretion. Almost simultaneously with the appearance of the amidulin, which is incapable of being dialysed, two forms of dextrin are produced, both being highly diffusible. One of the dextrins is coloured red by iodine; hence its name of erythrodextrin; the other, yielding no coloured compound with this reagent, is termed achroodextrin; whilst amidulin gives, like raw starch, a dark blue colouration. The three bodies can be separated when in solution together by precipitating the soluble starch with tannic acid, the dextrins being afterwards thrown down by means of alcohol. During the process of conversion the starch molecule $n(C_{12}H_{20}O_{10})$ is converted into a molecule of soluble starch, which is itself resolved by progressive deduplication and hydration into dextrin and maltose through the successive steps of erythrodextrin and achroodextrin, as exemplified in the subjoined table of Dr. Roberts.[1] The pancreatic ferment differs from diastase in the power which it possesses not only of converting the lowest achroodextrin into maltose, but also of transforming maltose into dextrin.

### *Proteolytic Ferments.*

The proteolytic ferments, which constitute the second great group of the digestive ferments, are if possible even more widely distributed than the amylolytic ferments. In the animal, and apparently also in the vegetable, kingdom this class of ferments

[1] Thus erythrodextrin, $9(C_{12}H_{20}O_{10})$ + maltose, $(C_{12}H_{22}O_{11})$, becomes achroodextrin, $7(C_{12}H_{20}O_{10})$ + maltose, $3(C_{12}H_{22}O_{11})$, which again, by a succession of steps, becomes reduced to a still lower form of achroodextrin, achroodextrin $\theta$, $2(C_{12}H_{20}O_{10})$ + maltose, $8(C_{12}H_{22}O_{11})$.

is divisible into a group which comprises those of the peptic type, in which the ferment is only active in an acid medium, and a second or tryptic, which digests only in alkaline solutions. All proteolytic ferments possess the power of converting, though in different degrees, the non-diffusible albumins into modifications which readily dialyse, are soluble, and are known as peptones.

### *The Peptic Ferment in Animals.*

The peptic ferment occurs as pepsin in the stomach of the vertebrata, and it was first isolated from this viscus by Schwann, though Eberle in 1834 had demonstrated that food mixed with gastric juice outside the body underwent certain digestive changes, and that an artificial gastric juice possessed of digestive properties could be obtained by treating the gastric mucous membrane with a very dilute solution of hydrogen chloride. Many years previously, viz., in 1777, the Abbé Spallanzani, to whose laborious investigations we owe the foundations upon which our knowledge of the digestive ferments rests, had pointed out that the process of digestion is rather one of solution brought about by the intestinal juices, than of fermentation in the sense of putrefaction, as was then held. The peptic ferment has also been obtained from the myxomycetes, one of those lowest forms of animal or vegetable life which Haeckel has classed amongst the protista; it has been detected by Krukenberg in the cœlenterata, as well as in all the higher animal sub-kingdoms. In those cases in which only one digestive ferment exists in the body, the peptic is more frequently present than the tryptic, except amongst the vermes and arthropoda, in which the converse appears to hold good. A peptic ferment has also been isolated from muscle, and by Munk from mixed human saliva; it is also said to occur in the yolk of hens' eggs and in decaying cheese.

### *Vegetable Ferments of the Peptic Type.*

In the vegetable kingdom the researches of Dr. Darwin and his son have gone far to prove that the carnivorous plants digest nitrogenous materials by the aid of a ferment which is very closely allied to the pepsin of animals. A ferment capable of digesting proteids in an acid, but not in an alkaline medium, has been isolated in the case of drosera and nepenthes. In regard to the latter plant, it may be noticed in passing, as an example of the remarkable way in which nature protects these digestive juices, that the orifices of the pitchers into which the ferment is secreted are covered with a kind of umbrella to prevent undue

or accidental dilution. A similar ferment with the power of converting albumins into peptones has also been discovered in the seed lobes of the common bean, as well as in the tissues of developing leaf-buds; whilst Nægele has found peptones in the yeast plant, and has been led to suppose that their presence may possibly be due to a peptic ferment.

### *Vegetable Ferments of the Tryptic Type.*

Messrs. Wurtz and Bouchut demonstrated last year that the sap of the papaya carica, a palm tree, native in South America, contains a proteolytic ferment which resembles trypsin more nearly than pepsin, since it is active in neutral and slightly acid or alkaline solutions. The ferment isolated from the sap is called *papaïn;* it has the power of digesting and converting into peptone large masses of fibrin, as well as normal and pathological living tissues.

### *Comparison of Peptic and Tryptic Digestions.*

Peptic digestion differs from tryptic (or pancreatic) in the following points:—The former is acid and yields acid products; it is one of solution, as is seen by watching a piece of fibrin exposed to the action of gastric juice, when it will be found to swell up and gradually disappear, the digestion being impeded if the swelling be prevented by mechanical means, and it ceases with the formation of peptone. Tryptic digestion, on the other hand, is essentially alkaline and one of corrosion; by it the albumin is carried beyond the peptone stage to the ultimate products of proteid disintegration. Pepsin, moreover, has the power of digesting trypsin; gelatin treated with pepsin is converted into a kind of peptone, becoming diffusible and losing its gelatinising property; digested with trypsin it similarly becomes peptonised; and if bacteria have found their way into the solution, glycocoll and leucin are produced.

### *Isotrypsin and Metacasein.*

In certain of the vermes[1] Dr. Krukenberg has shown that the digestive ferment differs from that found in the vertebrata, arthropoda, and mollusca, and resembles more closely that which occurs in the asterids. To this variety of the tryptic ferment he has applied the term *isotrypsin.* Casein digested with pancreatic

[1] Aphrodite, Hermione, Siphonostoma, Arenicola, and the Lumbricidæ.

juice is first transformed into metacasein and then into peptone, the metacasein being distinguished from many other proteids by the fact that it is coagulated on boiling in neutral media—in which respect it resembles the ov- and ser-albumins—and that it is precipitated in the cold by the addition of acetic acid.

### *Peptones.*

Peptones are the products of the gastric and pancreatic digestion of albuminous bodies; they are of various kinds, as will presently be shown. True peptones are diffusible substances, soluble in water, and not precipitated by boiling. They give a red instead of a violet colour when a trace of copper sulphate is added to a strongly alkaline solution, and do not answer to either Millon's reagent or the xanthoproteic reaction. They are not precipitated by the addition of boiling nitric acid or by acetic acid and potassium ferrocyanide, as are other albumins; they are thrown down but are not coagulated by an excess of absolute alcohol.

### *Theory of Digestive Proteolysis.*

Under the action of pepsin albumin is apparently broken up into antipeptone and hemipeptone. The antipeptone has an antecedent, antialbumose (the parapeptone of Brücke), an imperfect peptone, agreeing in its general characters with syntonin, and undergoing no change on further digestion with pepsin, though it is converted into antialbumate on boiling with sulphuric acid. Hemipeptone, on the other hand, has hemialbumose (the A peptone of Meissner) as an antecedent. Hemialbumose is soluble in dilute acids and alkalies as well as in a 10 per cent. solution of sodium chloride; it is transformed by further digestion with pepsin into hemipeptone, and by treatment with sulphuric acid at 100° C. into leucin and tyrosin. The pancreatic digestion is much more complete and thorough than the gastric digestion, as is well seen if milk be digested with trypsin, for it will rapidly disappear, leaving only a small residue; whilst with pepsin it is only slowly digested, and there remains a considerable residue. Tryptic digestion either completes the gastric process by converting antialbumate and hemipeptone into leucin and tyrosin, or it converts unaltered albumin into these bodies. If an artificial digestion of proteids be performed with pancreatic juice, it will be found that indol, a crystalline body forming the starting-point of the indigo series, will generally be produced. This substance, which, as previously stated, possesses a very evil odour, is a putrefactive product, due, according to

Kühne, to the bacteria which infest such digestions; it does not appeared to be formed when the experiment is carried out aseptically. This substance is produced to a small extent during healthy digestion, probably by the schizomycetes, which have been shown to invest the healthy alimentary tract. If the experiments of Salkowski are correct, the pancreatic fluid differs from all the other ferments of the body, for he has shown that peptones, leucin, and tyrosin are produced by it after exposure to a heat of 160° C. As in the amylolytic fermentation, the change brought about in proteids by the agency of the peptic and tryptic ferments are in the main the results of progressive deduplication and hydration. Henninger indeed believes that by a converse process—viz., by the use of dehydrating agents—he has been able to produce albumins from peptones. Albumins can be transformed into peptones, and the natural processes of digestion can be thus far imitated by subjecting the foods to the action of acids or of superheated water.

### *The Rennet Ferment.*

It has long been known that milk becomes curdled after treatment with an infusion of the gastric mucous membrane,—a fact which has for ages received a practical application in the manufacture of cheese. Until recently this milk-curdling property of the stomach was supposed to be dependent upon the acid reaction of the gastric juice, but Hammerstan has shown that it is in reality due to a special ferment. This ferment is present in the mucous membrane of the stomach of nearly all animals except fish, though small quantities only can be obtained from birds; it exists to a less extent at the cardiac than at the pyloric extremity, and can be isolated and separated from pepsin by precipitation with carbonate of magnesia or sugar of lead. During the present year Dr. Roberts of Manchester has succeeded in obtaining a rennet ferment from the pancreas of the pig, sheep, calf, ox, and fowl, and he has reason to believe that a ferment with similar properties exists in the intestinal juice. The pancreatic rennet ferment is not, however, identical with that which can be obtained from the stomach, as it is active in strongly alkaline solutions, as well as when the milk is neutral or slightly acid.

### *Rationale of the Rennet Fermentation.*

The rationale of the process of rennet fermentation is not yet fully understood. Hammarsten believes that it is due to the

conversion of a soluble into an insoluble form of casein. The rennet fermentation differs from the curdling of milk by the bacterium lactis in the following points:—The coagulum resulting from the action of rennet is cheese, and, as such, consists of thick lumps which cling together, and require five or six times more caustic soda and sixteen to eighteen times more acetic acid to dissolve them than does casein; whereas the souring of milk produces a finely granular, flocculent, and soft precipitate of casein, which is readily soluble in dilute alkaline and acid solutions.

### *Ferments with an Action on Fat.*

Certain ferments are said to exist which break up the fats consumed as food. Of these the chief are steapsin, existing in the pancreas, and a ferment in the spleen, both possessing the power of decomposing fats into glycerin and their corresponding fatty acids. Brücke, whose experiments have been repeated and extended by Gad and Roberts, has found that oils and fats which contain an admixture of free fatty acids—in other words, which are more or less rancid—are readily emulsified by slight agitation with a weak solution of sodium carbonate, or even by the simple contact of a rancid oil with the alkaline solution. The pancreas contains alkali albumin, and it is upon the presence of this form of albumin that its emulsifying but not its fat-digesting power is probably explicable, since it appears to secrete a distinct ferment, though it has not yet been isolated. It is stated, moreover, that all fresh animal fluids are capable of converting fats into an emulsion.

### *Invert Ferments.*

The invert ferments transform cane-sugar, which is of little use in the animal economy, into the more serviceable invertin, a mixture of glucose and levulose. The ferment exists in the mucous of the gastric juice, where it appears to be analogous to but distinct from ptyalin; in the succus entericus of the small intestine in the dog, pig, rabbit, hare, fowl, and frog; as well as in the intestine of the silkworm and from the bee. Berthelot has isolated a somewhat similar ferment which possesses the power of transforming glycerin and mannite into glucose from the tisues of the testis. Amongst vetegables an invert ferment exists in yeast, in seeding beetroot, and in the flowering sugar-cane, as well as in the pollen of firs and pines. Claude Bernard described the invert ferment found in yeast in the following words, which at the same time indicate the method of separating

it:—"The fungous ferment has beside it in the same yeast a sort of servant given by nature to effect this digestion. The servant is the unorganised inversive ferment; it is soluble, and as it is not a plant but an unorganised body destitute of sensibility, it has not gone to sleep under the action of the ether, and thus continues to fulfil its task."

### *Glucoside Ferments.*

In the vegetable kingdom certain ferments exist which do not appear to have any analogies in the animal. Of these, the ferments which split up glucosides or bodies possessing potential glucose are the best known. Thus emulsin or synaptase existing in oil of almonds transforms amygdalin into glucose, essence of bitter almonds, and prussic acid, whilst it acts in a similar way upon other glucosides.[1] According to Liebig, yeast also acts in the same manner upon these bodies. Myrosin, another ferment of the same class, has the power of converting potassium myronate into glucose, volatile oil of mustard, and potassium sulphate. An erythrozym which splits up glucosides has been discovered by Schunk in madder root, by means of which rubian is converted into a number of new substances, amongst which alizarin is the most remarkable. This latter ferment also possesses the power of setting up alcoholic fermentation in saccharine solutions, forming succinic acid amongst other products.

### *Pectase.*

According to Fremy, all vegetable tissues containing pectose (the material which gives to unripe fruits their peculiar hardness, and which is subsequently converted into the pectin of ripe fruits), contain pectase, a ferment comparable in its mode of action to diastase or emulsin. Under the action of this ferment pectin is converted into pectosic and pectic acids.

### *Lactose Fermentation.*

Du Bois Reymond has demonstrated the presence in muscle of a ferment capable of converting lactose into lactic acid. The acid reaction of muscle which has become exhausted is probably due to the products of this variety of fermentation. A similar ferment is stated by Hammarsten to exist in the stomach; and if this be assumed, the coagulation of milk by the gastric

[1] Examples of glucosides are Coniferin, yielding Vanillin, Helicin, Arbutin, Phlorizin, Esculin, and Daphnin; Salicin, splitting up into Glucose and Saligenin; and Digitalin into Glucose and Digitaliretin.

mucous membrane may be accounted for on the hypothesis that the lactose is converted into lactic acid, the casein being precipitated from the acid solution thus formed.

### *Casein Ferment.*

A ferment exists in the mammary gland which has the power of transforming ov- and ser-albumins into casein. It can be isolated by the glycerin method, to be presently described, and is then found to be active in dilute alkaline solutions.

### *Urine Ferment.*

Urea exposed to the air, or, in certain cases, urine whilst it is still in the bladder, becomes converted into carbonate of ammonium, a change which is supposed to be brought about by an organised ferment. The presence of this ferment in the air has been demonstrated by Miguel, who has only been able to detect it, however, in the neighbourhood of ammonium carbonate factories and near badly cleansed urinals. Cazeneuve and Livon have shown that though torulæ (micrococcus ureæ) are largely developed during the fermentation of urine, they are not essential to the process, and that the real ferment, about which little or nothing is known, belongs to the non-morphological group. Musculus finds that this ferment is soluble in water and that it is precipitated from its solutions by alcohol and acetic acid, but not by sodium chloride. It is inactive if it has been precipitated by acetic acid or exposed to a heat of 80° C. or to the action of the most dilute acid. The aqueous solution mixed with urea and heated to 35°–40° C. decomposes the urea completely, with formation of ammonium carbonate. Acetamide and oxamide treated with this ferment give off only traces of ammonia, whilst hippuric and uric acids, kreatin, and guanidin are completely decomposed by it, but not till after the lapse of some days.

### *The Fibrin Ferment.*

Dr. Andrew Buchanan, whose experiments upon the coagulation of blood have been recently disinterred by Professor Gamgee, pointed out in 1845 that the fluids obtained from certain serous sacs, though they do not coagulate spontaneously, may be made to yield a coagulation of fibrin on the addition of blood or blood serum. This peculiarity of blood in effecting coagulation Buchanan not inaptly compared with the action of rennet on milk; and his experiments led him to suppose that this pro-

perty belonged to the colourless corpuscles. Professor Schmidt of Dorpat, whose name is particularly associated with the phenomena of blood coagulation, has entered upon an extensive series of experiments in regard to this subject, from the results of which he has been led to suppose that fibrin is derived from the interaction, though not necessarily from the union, of two albuminous substances existing in a soluble form in the blood and in many of the serous fluids. The interaction of these two substances is effected by means of a ferment which is liberated on the destruction of the white blood corpuscles. The two fibrin-forming elements, called respectively fibrinogen and fibrinoplastin or paraglobulin, belong to the globulin group of albumins; both can be precipitated by saturating the fluid in which they are dissolved with a neutral salt, or by passing through it a current of carbon dioxide. The fibrinoplastin is, however, more readily precipitated than the fibrinogen, so that the latter can be obtained from a solution which contains both substances by first precipitating the paraglobulin, which may be filtered off, and subsequently throwing down the fibrinogen by means of a further current of carbon dioxide. The fibrin ferment is almost insoluble in distilled water, but is more readily soluble in saline solutions of moderate strength. It appears, moreover, that reagents which precipitate the globulins diminish to a remarkable extent the activity of the ferment. From the consideration of these and other points, Professor Gamgee has been led to believe that the ferment in question is itself a proteid body, belonging to the group of globulins, and, as has been already stated, that it resides in the white corpuscles, or possibly from the hæmatoblasts, since it is certainly derived from the detritus of these bodies. Hammarsten, however, believes that the coagulation of blood depends upon the production of fibrin from fibrinogen only, under the influence of the ferment.

### *Myosin Ferment.*

A ferment analogous to the fibrin ferment is supposed by Michelson to exist in muscle, and to effect its coagulation probably by its action on the myosin. This ferment has not yet been isolated.

### *Isolation of Ferments.*

A variety of methods have been from time to time adopted for the isolation of the various ferments, though the ones most in use at the present time are those of Brücke and Von Wittich. *The method of Brücke* depends upon the mechanical precipitation of

the ferment, the resulting product being so pure as to give only a very slight proteid reaction to the ordinary tests. Taking as an example the mucous membrane of the stomach—although the method answers equally well for any ferment-containing tissue—the process of isolation is as follows:—The stomach of a freshly killed pig is deprived of its mucous coat, which is then minced and digested with a 5 per cent. solution of phosphoric acid until digestion is complete. The extract thus obtained is neutralised with lime-water, when a precipitate falls which is collected on a filter, pressed, dissolved in a minimum of dilute hydrogen chloride, again precipitated with calcium hydrate, re-collected on a filter, and pressed a second time. The calcium phosphate, to which the pepsin is now attached, is again dissolved in dilute hydrogen chloride, and the solution is put into a large flask, in which it is shaken up with a solution of cholesterin, made by saturating in the cold four parts of alcohol and one part of ether with cholesterin. The cholesterin separates out and rises to the top of the solution, is filtered off, is washed with water acidulated with acetic acid, and afterwards with distilled water, until the hydrochloric acid reaction ceases. The cholesterin carries up with it mechanically the pepsin, and after being thus purified is dissolved in ether. A clear neutral fluid then remains, which on being acidified is found to possess energetic peptic properties. From this process of isolation it is evident that ferments, though precipitated by alcohol, are not thereby coagulated, since their peculiar properties remain intact after removal of the alcohol.

*The glycerin process of Von Wittich* is much simpler than the preceding. It consists in throwing the finely minced mucous membrane or gland into glycerin, or the tissue may be first left for a few days in alcohol to precipitate and coagulate the proteids; it should then be dried and placed in glycerin to extract the ferment. In either case the glycerin dissolves out the ferment, and becomes possessed of powerful digestive properties.

A ferment may in many cases be isolated by rubbing up the tissue with sand, and subsequently extracting with water, or by simply throwing it into a saturated aqueous solution of salicylic or formic acid. After numerous experiments, Dr. Roberts finds that he can obtain useful extracts of ferments by means of a 3 to 4 per cent. boracic solution containing two parts of boracic acid and one part of borax; by a 12 to 15 per cent. solution of rectified spirit; or by the use of the aqua chloroformi of the British Pharmacopæia. The process for separating the rennet ferments was introduced by Benger, and consists essentially in treating the gland with a saturated solution of brine.

*Theory of the Formation of Soluble Ferments.*

Many investigations have recently been conducted with a view to determine whether the ferments exist as such in the glands, or whether they are manufactured at the instant of secretion from some ferment-containing substance existing in the gland cells.

Heidenhain and other experimenters have found that if an extract be made from a fresh and still warm pancreas, it will possess little or no digestive power; whereas, if a portion of the same gland be exposed to the air for twenty-four hours, the extract which can then be obtained from it will be as active as usual. In many cases the inactive extract which has been obtained from the fresh pancreas can be rendered digestive by the addition to it of a dilute solution of sodium carbonate; and, similarly, if the pancreas be rubbed up with a 1 per cent. solution of acetic acid, and a glycerin extract be then made, it will be found on neutralising to possess active digestive properties. An inactive extract of the gastric mucous membrane can also be often rendered active by the addition of an acid. These facts appear to point to the following explanation of the formation of non-morphological ferments. The ferments do not actually exist in the glands from which they are obtained, but an antecedent body is present in the cells which is capable of ready conversion into ferment, and to this body the name zymogen has been given. The term "zymogen" thus applied is used as a generic title for the substance from which the various ferments are produced; whether it circulates in the blood as a supply from whence the various glands draw their ferments, or whether it is manufactured *de novo* by the cells in each gland, is not yet ascertained. It appears possible, however, that the zymogen circulating in the blood is seized upon by the cells of the various glands, and is converted by them into the immediate antecedent of the ferment which it is their duty to produce. These antecedent bodies have received names, in the case of the salivary glands, of *ptyalogen;* in the stomach, *pepsinogen;* in the pancreas, *trypsinogen.* In each case the substance is transformed into ferment either by the act of secretion, or, as Dr. Foster suggests, by the action of an acid or alkali developed in the cell at the instant of secretion. This latter explanation is borne out by the experiments mentioned above, in which the addition of an acid rendered active the previously inert extract; for we may suppose that in these cases the trypsinogen, &c., has been dissolved out by the glycerin, and only required the addition of the acid to convert it into ferment. This theory is also supported by histo-

logical observations carried out by Heidenhain and Kühne in Germany, as well as by Langley and Sheridan Lea in this country, in regard to the appearances presented by the living and hardened secreting glands. These observers have found that the cells of the glands present a different appearance according as they were observed in animals which were fasting or in full digestion. Each secreting cell of the pancreas consists of two zones,—an inner, situated nearest the lumen of the duct round which the cells are arranged, which is studded with fine granules, and stains with difficulty in carmine; and a smaller external zone, which is homogeneous and marked with delicate striæ. During the quiescent state of the gland the inner zone is very large and is packed with granules, the outer zone being small. When the gland is secreting, however, the granules and inner zone diminish in number and in extent, whilst the whole cell becomes hyaline and transparent. Heidenhain believes that the quantity of trypsinogen varies in direct relation with the size of the inner zone. In the salivary glands the inner zone of each cell is clear, whilst the outer zone is granular and stains readily. The quantity of ferment-producing substance contained in the glands varies from time to time; it sinks gradually from the commencement of digestion, until it reaches a minimum six to ten hours after the ingestion of food. From this period it rises gradually until it attains its maximum sixteen hours after the last meal, the maximum being maintained until the thirtieth hour, after which it is slightly reduced, though it remains tolerably high until the next meal.

Few observations have been made in regard to the elimination of ferments from the body; trypsin has, however, been found in the urine, ptyalin and pepsin only in the very minutest quantity. Further experiments are needed in regard to this point.

### *Separation of the Soluble from the Insoluble Ferments.*

A variety of methods have been suggested for the separation of the soluble and insoluble ferments. Thus Paul Bert found that oxygen or ordinary air at a high tension arrests the action of the morphological ferments, whilst the non-morphological ferments continue active during compression, and after removal from compressed air retain all their power. Borax, on the contrary, destroys the soluble, whilst it exercises little or no effect upon the particulate ferments, though it is stated that the borates have no effect upon very active soluble ferments. M. Müntz, who has paid special attention to the question of distinguishing between the two classes of ferments, believes that

ferments endowed with life are most active at a temperature varying between 25° and 40° C., whilst the activity of chemical ferments have their maximum sensibly higher, at a temperature where life is only with difficulty manifested. He has also shown that we have in chloroform an agent which effects the separation for us in a very definite manner. By the use of this substance M. Müntz found that after beer yeast had been under the influence of chloroform for several hours, it never appeared to resume its action on saccharine matters with its original intensity after the chloroform had been withdrawn, whilst the lactic ferment appeared more capable of recovering its ordinary powers. Prolonged contact with the chloroform induced death of the organised ferments, though it neither retarded nor prevented the action of the unorganised forms.

### *Conclusion.*

We have thus traced out in a brief and incomplete manner the various ferments which are at present known, dividing them into two main groups, each group being again subdivided into classes. In regard to the morphological or formed ferments, it has been pointed out that they are of a vegetable nature, and that their power is conterminous with their life, whilst it is arrested or entirely destroyed by a variety of reagents, which have no effect upon the soluble ferments. The non-morphological ferments, though in some points they differ widely from, yet in other points approximate closely to, the preceding class. They have been shown to exist in very low forms of life, vegetable as well as animal, and there does not appear to be any valid reason why the saccharo- and schizo-mycetes should not be dependent upon a ferment which is secreted by them, and is in reality of the non-morphological type; for it can scarcely be supposed that the secretion of these substances should cease suddenly and abruptly on reaching the protophytes and protozoa. The experiments of Claude Bernard and Kühne, which have already been alluded to, show, in fact, that such is not the case, and that an extract containing a non-morphological ferment can, in some cases at any rate, be obtained from a ferment of the morphological group.

SOME

# CASES OF INTRA-CRANIAL SYPHILIS.

BY

J. A. ORMEROD, M.B.

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The work of many able investigators has shown that syphilis is not only a possible cause, but also a very common cause, of nervous disease; and, further, that much may be done during life to recognise this factor, and distinguish it from others. It is important to determine the nature as well as the locality of nervous lesions, at least in instances of syphilitic disease, when timely treatment may avert a disastrous ending.

It may not be out of place here to attempt a brief summary of what is known with reference to this subject. Syphilis affects, as a rule, not the brain substance primarily, but the envelopes of the brain, either as disease of the bones or as a meningitis, subacute, spreading gradually, and interfering secondarily with the functions of the cortex or of the nerve trunks at the base; or as circumscribed tumours, gummata, which may occur at the base, in the Sylvian fissures, or on the convexity, or much more rarely in the interior of the brain. Such lesions are often multiple, so as to occasion a certain incongruity of symptoms; their growth is not necessarily progressive, and they may be amenable to appropriate treatment.

Again, syphilis may affect the coats of the cerebral arteries; according to Heubner,[2] in the form of a growth between the endothelium and membrana fenestrata, which destroys the elasticity of the tube, and tends to narrow or block it altogether. Whether syphilis ever affects nerve substance directly can scarcely be considered as yet certainly determined.[2] Some affections, such as the "ophthalmoplegiæ" of Hutchinson, acute ascending spinal paralysis, and certain cases of locomotor ataxy, have been ascribed to this cause; but the coarser syphilitic lesions affect the nervous

[1] Die Luetische Erkrankungen der Hirnarterien, p. 125.
[2] Medico-Chirurgical Transactions, vols. lxi. and lxii.

substance only indirectly. As regards diagnosis, though the individual symptoms may be determined by the position rather than by the character of the lesion, yet there may be enough in their grouping, course, &c., to be distinctive of their cause. To establish from independent evidence the existence of syphilis as a *vera causa* is of the greatest importance; but such evidence is often wanting. We are then thrown back on some such considerations as the following:—

Can we, from the age or physical condition of the patient, or from peculiarities in the onset or course of the symptoms, exclude other ordinary causes of nervous disease that might give rise to them? Is there evidence of coarse structural disease in the regions which syphilis is known specially to affect? Are the symptoms such as to require for their explanation more than one lesion? What effect has anti-syphilitic treatment?

Take the cases, first worked out by Dr. Jackson, of epileptiform attacks. These, when they occur for the first time in middle life, are to be regarded with suspicion; according to Fourier, to be treated at once as syphilitic. If severe pain in the head precede the attacks, the suspicion is strengthened; if the convulsive fits begin deliberately and develop in a regular course, if the convulsions be unilateral, and if there be double optic neuritis, the existence of some coarse lesion, causing irritation of the cortex, is rendered probable. And such lesions we know to be frequently syphilitic.

Or take the case of a hemiplegia. Obstruction of a cerebral artery through syphilitic disease is one of a number of possible causes. The paralytic symptoms, however, depend on the tract of nerve tissue supplied by the diseased artery rather than on the cause of the arterial disease. Is, then, the diagnosis of arterial syphilis possible? Something may evidently be done towards it if we can exclude other causes—cardiac or renal disease, senile changes, tumour, &c.—and perhaps no more will be possible. Dr. Broadbent[1] suggests that in cases of syphilitic thrombosis the symptoms are more varied than in embolism, because in the latter one artery—the left middle cerebral—is commonly affected, and the paralysis is therefore right-sided. Dr. Buzzard[2] draws attention to a peculiar condition occurring in this disease. "A state of obfuscation and somnolence, not amounting to coma, but lasting in each case for many weeks." Heubner[3] also lays great stress on this symptom—an incomplete suspension of all the higher cerebral functions, lasting long, and subject to unexpected fluctuations, or perhaps drifting into fatal coma. Indeed, when this

[1] Lettsomian Lectures, Lancet, February 21, 1874.
[2] Lancet, June 17, 1879.
[3] Op. cit., pp. 227, 230.

condition occurs at or before middle age in a patient thought to be syphilitic but otherwise healthy, and when associated with a hemiplegia that has been ushered in by attacks of temporary loss of consciousness, he considers it to be diagnostic of arterial syphilis. These symptoms he interprets,[1] as I understand him, as follows:—The initial "fits" are due to stoppage of some arterial branch to the cortex, and are transitory on account of the anastomoses which, according to his account, exist in the pia-mater. The hemiplegia is due to stoppage of a branch to the basal ganglia, and is permanent because these branches are terminal; the somnolent condition to a general anæmia of the cortex, caused by the gradual spread of the syphilitic disease, or of the thrombosis induced by it, among the main arteries at the base.

## Case I.

James C., 34, ironworker. In John Ward, under Dr. Church, from March 16 to April 6, 1878.

On March 4, a "numbness" began in the left forefinger, which soon spread to the whole hand. On March 9, pain in the right side of the head, and giddiness, with loss of power in the left hand. This got worse till the 13th, when he was seen in the Surgery. He could then walk well, and did not complain of the leg at all. Ordered hst. pot. iod. amm. gr. iij. ter.

On the 16th he came again, complaining of difficulty in walking, and dragging the left leg. The headache continued. Condition on admission: Somewhat thin; face flushed; tongue flabby, nearly clean, protruded naturally. Temp. 98°; pulse 64, soft; artery natural. Heart sounds clear. Urine free from albumen and sugar. Can move the left arm, but in a feeble and faltering way; tactile sensibility impaired in the fingers. Can move the left leg, but less readily than the right. Muscles well nourished; faradic contractility normal. Numerous suspicious scars on the legs and thighs. Had gonorrhœa in 1864, but never a chancre to his knowledge. Has three children; his wife has never miscarried. Ordered pot. iod. gr. x. sextis horis.

In eight days the headache had gone, and the paralysis began to improve. By April 6 he could walk quite naturally; the grasp of the hand was firm, and he complained only of a certain stiffness of the middle and index fingers. No distortion of the face was at any time noted. There were no convulsive attacks.

The gradual onset and spread of the paralysis, and the severe pain on the right side of the head, suggest that there was local

[1] Op. cit., chap. iv.

disease, possibly meningeal, in that quarter; the age of the patient, the scars on the legs, and the rapid recovery under iodide of potassium suggest that it was syphilitic.

### Case II.

William F., middle-aged man, commercial traveller. Under Dr. Church from February 28 to the end of May 1877. The earlier notes by Dr. Verco.

February 28.—He was brought to the Surgery this afternoon at 4.15, having been found in the shop of a friend in a "fit." He was quite unconscious; there was blood about his mouth; his pupils were dilated, equal in size; his eyes turned upwards and to the left; his arms were tossed about as if in pain. Pulse 112. Resp. 22. He was admitted. At 5 P.M. twitching began in the left arm, and he had a very severe epileptic fit.

11 P.M.—Three more fits of great severity have occurred. He has remained unconscious; his eyes still deviate to the left; his breathing is heavy. Pulse irregular, 116. Resp. 12. Temp. 98°. Has just vomited profusely.

His wife states that during the last twelve months he has been liable to fall in the streets without any feeling of giddiness; that lately he has become very forgetful and drowsy; about a week ago he sat in a chair from the Saturday morning to the Sunday night; that he has complained of a feeling of pressure in the head.

A friend who brought him to the Hospital says that two of his family have become insane.

Subsequently his wife brought a daughter who was evidently suffering from amentia.

March 1.—Another severe fit last night. This afternoon there is a slight return of consciousness. He answers "Yes" to almost any question; attempts to talk, but produces only incomprehensible sounds. Breath fetid. A slough on the left side of the tongue. Pulse regular, 128.

March 3.—Very restless in the night. Says a few words: "Well," "Very well," "All right," &c., in answer to any question. Notices what is going on around him.

March 4.—Became restless and unmanageable in the night, and was removed to Casualty.

March 5.—Became quiet and slept last night after the third dose of the following mixture: træ hyoscyami, ℥ss.; pot. bromidi, ℥ss.; aquæ menthæ pip. ad. ℥iss. quartis horis.

March 6.—Has been very somnolent all day. Can say a few more words.

The case was treated as syphilitic, with the result that by the

end of March he had improved sufficiently to be up and out in the square, suffering only from impairment of memory and dimness of vision in the left eye. An examination of the fundus showed "partial atrophy of the optic disc; the margins of the disc blurred and irregular, with incomplete atrophy of the choroid for a considerable distance, and a good many other patches of atrophy scattered elsewhere over the choroid."

April 6.—Another fit this morning; it began with twitching in the right arm, followed by jerking of the head and convulsions, chiefly on the right side. It was followed by right hemiplegia. He remained semi-conscious till the evening, when he became violent, calling out "My side," as if in pain. One dose of the bromide and hyoscyamus mixture quieted him.

April 7.—Again semi-comatose and suffering from twitching of the right limbs during the day; noisy in the evening.

After this he began slowly to recover consciousness and power in the right limbs. By April 16 he was quite conscious, and could move the right arm and leg, though in an incoördinate fashion. He continued, however, to be frequently noisy at night, and to have attacks sometimes of spasmodic movements in the right arm and leg, sometimes of sudden pallor and stoppage of respiration. His motions passed for the most part under him. There was no albuminuria.

When discharged on May 26, the leg had recovered sufficiently to enable him to stand, and he had regained a certain amount of intelligence.

The treatment during the latter part of his illness consisted of mercurial inunction and pot. iod. gr. x. ter die.

Though I find no history of primary syphilis, certain facts were strongly suggestive of that disease.

(1.) That these, his first epileptiform attacks, began in middle life.

(2.) The curious somnolent condition noticed to precede them.

(3.) Their character, beginning in the hand and arm, and leaving well-marked hemiplegia.

(4.) The diagnosis of syphilitic retino-choroiditis, made independently by Mr. Vernon.

## Case III.

The next case, Elizabeth G., 31, was under me at the Metropolitan Free Hospital.

Summary of symptoms—

Pain in head, severe at first and continuing more or less throughout her illness.

Neuro-retinitis of right eye, with subsequent atrophy of optic nerve.

Paralysis of the right oculo-motor nerves, and of the first and second divisions of the right fifth nerve; recovering.

Neuro-retinitis of the left eye; recovering.

Nervous affections (viz., pain, sensory and motor paresis) of the left and again of the right limbs.

The paralysis of the cranial nerves above mentioned may be accounted for by the supposition of a meningitis in the neighbourhood of the right cavernous sinus, where they are in juxtaposition, and tending to spread, as a transient anæsthesia of the other side of the face showed.

The affection of the fundus oculi consisted, I believe, in a retinitis, followed by optic neuritis. The impairment of vision preceded the coarser ophthalmoscopic changes.

The affections of the trunk and limbs which followed later may indicate possibly some affection of the crura cerebri consequent on the original lesion, or else some independent lesion.

The pain in the head, an important index of active mischief, varied in character; it was sometimes an aching at the back of the eyes or head; sometimes sharp shocks, which made the patient start suddenly, and left "a lingering pain;" sometimes "a faintness which seemed to come from the back of the head to the eyes and to take her eyesight away." Exacerbations of it occurred more than once after an intermission of specific treatment.

Dec. 2, 1879.—Complains of pain in the right eye and over the forehead, and of failing sight in the right eye. A fortnight ago she became giddy and fell, striking her right eye, and she dates her complaint from that time. The sight of the left eye also is said to be not so good as it was.

A dark-complexioned woman, well nourished, but sallow and flabby looking; evidently in considerable pain. She says the fall has left a scar on the right eyelid; but no trace of injury can be found. Right conjunctiva congested; pupil small, acting normally; no increase of tension; nothing abnormal to be made out with the ophthalmoscope. With that eye she cannot count fingers at three feet distance.

Ordered a belladonna lotion and pot. iod. gr. xv. ter.

Dec. 9.—Pain no better. Ptosis of right eyelid, and complete immobility of eyeball. Numbness and anæsthesia of all the right half of the face, except the part below a line joining the nose and the right angle of the jaw. No paralysis of facial muscles, tongue,

or limbs; no difficulty in mastication. Right eye: pupil of medium width, inactive to light; edges of optic disc hazy.

Ordered pot. iod. gr. xx. ter, and advised to come in, which she refused to do.

Dec. 12.—Pain rather better; ptosis as before; eyeball still immovable. Anæsthesia of face less in degree. Vision of right eye slightly improved; she can count fingers. Right fundus: disc foggy and greyish looking, its edges much blurred; retinal veins full, traceable to their point of convergence; arteries small, interrupted here and there. Pot. iod. gr. xxx. ter.

Dec. 16.—Pain at the back of the other (left) eye came on three days ago, and seems to be severe. Some numbness and incomplete anæsthesia over the left frontal eminence and left malar bone. The other conditions remain as before, except that she is completely blind with the right eye; the disc is so foggy as scarcely to be made out, and the vessels are almost hidden by effusion. She was admitted; the following particulars were then made out by the House-Surgeon. She had had six children, most of them born dead, and all of them now dead but one. After the birth of one child, she had a sore throat, which lasted some time. Early in 1877 she was treated in the laryngeal department of St. Bartholomew's Hospital for persistent hoarseness. Her husband died some years ago of a "complication of disorders."

Temperature next morning, 99°. Pulse, 84. Complaining of cramps in the legs. The *left* optic disc hazy, especially at the lower border, where a thin film seems to spread along the course of the vessels. Yet she can read small print with that eye.

Dec. 24.—Drowsy. Anæsthesia gone from the left side of the face, and diminishing on the right. The right eyeball moves a little inwards.

Left fundus: edges of disc indistinct, retinal veins large, arteries small, and interrupted in places. Right fundus: almost structureless; masked by a reddish-grey film; a small indistinct spot rather whiter than the rest, with a few faint streaks (vessels?) in its neighbourhood, marks all that can be seen of the disc.

To continue the iodide. Ung. Hydrarg. ʒi. to be rubbed into the armpit every night.

Dec. 30.—Constantly sleeping. Anæsthesia of face quite gone; ptosis of right eyelid less; more mobility of the eyeball. Vision of left eye much impaired; counts fingers only at a few feet distance. The condition of the left fundus begins to approximate to that of the right. Gums very sore and inflamed.

To leave off the mercury; to continue the iodide. Gargarisma pot. chloratis.

Jan. 6.—Pain in the head again becoming severe; still drowsy.

Vision of left eye so far improved that she can read small print (= 4 to 6 Jäger); the fundus looks more clouded, if anything. Right eye quite blind; a hæmorrhage over the position of the disc. The right eyeball accompanies the movements of the other, but squints outwards when at rest. Cat. sinapis to forehead.

Jan. 13.—Much brighter; pain better. The fundi of both eyes beginning to clear, especially the left.

Jan. 16.—Darting pain in ball of left thumb, left elbow, and knee.

Jan. 20.—Complexion clearer; much less somnolence. Numbness in the left hand and foot; grasp of left hand enfeebled; tactile sensibility in fingers impaired. Tenderness of brachial plexus and of ulnar nerve at elbow. Anæsthesia in the two external toes of the left foot and over the tibia; tenderness to pressure in popliteal space.

By the end of a week these symptoms had given place to a numbness and anæsthesia of the left thigh, with tenderness to pressure over the anterior crural nerve; this again soon cleared up.

Jan. 23.—Fundus of left eye normal. Outlines of right disc beginning to show; the patch of hæmorrhage has been gradually absorbed, leaving in its place a zigzag of small red streaks on the surface of the disc; the retinal arteries show as thin streaks; the veins are thicker and ill defined.

Feb. 6.—Pain in head worse; alternate chills and sweats; a "catching" pain in left flank. Temp. 98°. Nothing made out by physical examination of chest. Hst. quiniæ ter die. instead of the iodide.

The chills disappeared and her general health improved, but the pain in the head became more severe. She was very giddy on walking, sitting up in bed, or when the bed was moved. A repetition of the iodide having failed to do good, mercurial inunction was recommenced cautiously, and appeared to give her great relief.

The right optic disc (Feb. 3) showed signs of commencing atrophy, the vessels being smaller, and the disc itself a more dead and uniform white than in the left eye.

She left the Hospital early in March, since which time the course of her complaint has been much as follows:—The pains in the head have abated gradually, though not entirely gone (Sept. 23); the right disc shows signs of atrophy, though not to an excessive degree; there have been nervous affections of the limbs, somewhat variable and transitory in their nature.

March 12.—Treatment resumed; pot. iod. gr. v.; liq. hydrarg. perchl. ℥ss. to ℥i. ter.

16.—Pain and occasional "giving" of left leg.

19.—Pain in left leg and right foot, causing her to totter.

April 2.—Left leg and right hand said to swell.

9.—Has had severe pain in left arm and leg, confining her to bed. Drags the left leg as she walks.

20.—Medicine stopped on account of salivation.

27.—Recurrence of headache. Pot. iod. gr. xx. resumed.

May 7.—Some impairment of vision in left eye; reads 1.2 Snellen only. Anæsthesia of left calf and foot. Cannot stand on left foot alone. Numbness, "pins and needles," in left leg.

May 25.—Left leg improving. Numbness and some loss of power in the right arm.

June 3.—Numbness and pain in right hand; grasp of that hand feeble; tactile sensibility impaired. Anæsthesia of right foot and leg; cannot stand on *right* foot alone. Meanwhile the left limbs have improved; with left eye she reads ·6 Snellen. With the right she continues unable to make out the largest type.

The affections of the right limbs got gradually well, and the specific treatment was stopped in the end of August.

When last seen (Sept. 23), she had had another attack of pain and loss of power in the *left* leg, but this was improving under a readministration of iodide.

# CHANGES IN THE OPTIC DISC

ASSOCIATED WITH

# SPINAL CONCUSSION.

BY

W. BRUCE-CLARKE, M.B.

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The term "spinal concussion" is usually employed in those cases of spinal affection which are generally allowed to be the consequence of some jar, wrench, or disturbance of the spinal column.

Such injuries, undoubtedly in some cases, at any rate, give rise, either immediately or after the lapse of time, to a varying train of symptoms. The lesion falls either on the muscular system, the mental faculties, or more rarely on the organs of circulation.

Of late years this class of disease has acquired considerable interest and obtained a large share of attention, owing to its occurrence in connection with railway accidents and from the prolonged litigation to which it may give rise. Oftentimes a slight injury is magnified with a prospect of obtaining a competency at the hands of the railway company, or the real sufferer may be mulcted of proper damages owing to his inability or unwillingness to face the ordeal of a law court.

Now in all such cases there are three factors to be determined: first, is the patient suffering from spinal concussion at all; secondly, is the concussion in any way due to the accident in question; and, thirdly, what is the probable duration and termination of the case at issue?

The two latter questions must always remain involved in a certain amount of obscurity, but of these two the prognosis alone has to be decided by the surgeon. In proportion as the pathology and clinical history of these cases is better understood will the true prognosis be arrived at.

Unfortunately the diagnosis rests almost entirely on subjective

symptoms, which will vary according to the nature of the patient and the mental attitude of his medical attendant. Hence any objective symptoms of this obscure complaint should be eagerly sought for, carefully weighed, and thoroughly appreciated.

Changes in the fundus of the eye have been often looked for and often seen, though it has been asserted they are more often present in the eye of the observer than in that of the patient.

The following cases of fundus change are the outcome of many observations in St. Bartholomew's Hospital;[1] and thus much at least can be urged in their favour, that none of the patients in question were suffering from the baneful influence of present or prospective compensation.

If any conclusion can be drawn from so small a series of cases, it would seem to show that changes in the optic disc of a transient nature do follow upon injuries of the cervical spine.

### Case I.

Michael D., 40.

Nov. 5, 1878.—Fell about fifteen feet on to his back on some castor-oil bottles. Several small scalp wounds. Complained of some pain. On admission was not altogether rational, though he could answer questions well.

10th.—As far as his scalp wounds go, he is all but well; but he complains of a good deal of pain about the upper part of his back and shoulders, especially when he turns over.

15th.—Mentally quite himself.

He still complains of the same pain about his shoulders, and when he attempts to leave his bed he walks with a very tottering gait, and complains of feeling weak all over.

No loss of sensibility or hyperæsthesia can be detected.

Dynamometer: right hand, 4 kil.; left hand, 8 kil.

There is slight pain on percussion over the seventh cervical and two or three upper dorsal vertebræ.

Examination with the opthalmoscope: There is intense hyperæmia of both optic discs, so that they can be with difficulty distinguished from the rest of the fundus, but there is no swelling of the disc or increase in the calibre of the vessels. He is not conscious of any defect of sight; but as he cannot read, no examination with test types is possible.

There has never been any rise of temperature.

Dec. 1.—Symptoms much the same.

[1] In Mr. Savory's wards, to whom I am much indebted for permission to make use of them.

12th.—The optic discs are now distinctly œdematous.

17th.—Pain in left shoulder much increased; he thinks this is due to a cough from which he is suffering.

Dynamometer: L. 15 kil.; R. 7 kil.

Feb. 4. 1879.—Continues much the same.

Dynamometer: L. 15 kil.; R. 12 kil.

Condition of the eyes is much the same.

March 10.—General condition much the same, perhaps a slight improvement.

When the top of his head is tapped, he complains of feeling pain between the shoulders. There is slight tenderness over the upper two or three dorsal vertebræ, but none over any part of the cervical region.

He complains of an occasional pain down his arms, with tingling sensations and a feeling of pins and needles in them.

Examination with ophthalmoscope: The discs are now œdematous only to a very slight extent; the outlines can be made out with ease.

Dynamometer: L. 26 kil.; R. 14 kil.

March 23.—Discharged able to walk with ease. Optic discs quite normal.

*N.B.*—In estimating the value of this case, it should be borne in mind that during the latter part of the time that the patient was under observation, he was fully aware that his case was one of some interest, and evidently endeavoured to make himself out as bad as he could.

Latterly it appeared that the dynamometer test was fallacious, as he could use it more easily when the nurses were set to test him as if for amusement; about the condition of his eyes, however, there could be no doubt.

## Case II.

Henry H., 17.

July 15, 1879.—Fell whilst carrying a sack on the back of his head and shoulders, and was for the moment stunned.

When admitted he seemed in a good deal of pain and unable to move his limbs properly.

17th.—Has recovered a good deal, and can move his legs well. The eyes do not present any change when examined with the ophthalmoscope.

31st.—No pain; arms still weak.

Aug. 10.—All but well. No change has ever been observed in his optic discs.

Discharged.

### Case III.

Henry S., 50.

April 23, 1879.—Fell whilst working in the Hospital and hit his head and back on the edge of a cupboard. Was insensible a few minutes.

Complains of feeling bruised all over, and unable to stand or walk.

Loss of power in lower limbs almost complete; can move his left leg a little as he lies. No increase of reflex action.

Sensation appears to be diminished over both legs, from the pelvis downwards. He is very stupid, and hence his exact condition is somewhat doubtful.

Quite unable to pass his water; slight priapism.

Does not complain of his arms at all.

There is no particularly tender spot to be made out in the vertebral column.

26th.—General symptoms much the same.

Ophthalmoscopic examination: there is decided hyperæmia of both of the discs, but no change in the retinal vessels.

29th.—Passed his water without the aid of a catheter to-day for the first time.

April 29.—Seems otherwise much in the same condition.

May 23.—Sensation in both legs now much more acute; normal. Movement in left leg restored. Right leg considerably better. He can stand by himself and walk a few steps without assistance.

He has had a small carbuncular swelling over the lower sacral region, but it is now all but healed.

The condition of the optic discs is about the same.

June 5.—There is still but little power of movement in the right leg; the left leg seems to be quite well.

The optic discs are much less hyperæmic than they were when last examined.

Discharged.

*N.B.*—This patient was told to come back as an out-patient, but has not since been seen.

### Case IV.

Benjamin S., 25.[1]

Jan. 28, 1880.—A bale of linen fell from a height of about forty feet on to his neck and shoulders.

[1] For the general notes of this case I am indebted to my friend Mr. Macready.

Admitted in a semi-conscious condition.

There is complete motor and sensory paralysis in all parts below the seventh rib.

29th.—His bowels are not open. His water has to be drawn off with a catheter. Priapism. Has vomited this morning. Breathing entirely diaphragmatic.

31st.—Bowels opened involuntarily. Temp. 101°. Well-marked hyperæsthesia in the region of the chest. Moans a great deal. He has never completely recovered consciousness.

Examination of eyes with ophthalmoscope: There is well-marked hyperæmia, with considerable œdema of both discs; a good deal of effusion obscures the vessels in many places.

Feb. 1.—A good deal worse. His throat is choked up with mucus, and he is a great deal more restless. After this date no further examination of his eyes could be obtained as he would not keep sufficiently still.

7th.—Died.

*Post-mortem.*—There was fracture of the fourth, fifth, and sixth cervical vertebræ, with complete division of the spinal cord at the level of the fifth and sixth vertebræ.

In none of these cases was the pupil at all dilated, nor could it certainly be said to be contracted.

It appears, then, from these cases, that out of four patients who suffered from an injury to the spinal cord about the lower cervical and upper dorsal regions, three had well-marked changes in the optic disc; and in the fourth, in whom no changes were visible, the injuries were of a much less severe character.

In the two patients who recovered, the changes were transitory; and unless they had been subjected to periodical examinations, no changes in the fundus oculi could have been even suspected.

A case[1] is quoted by Mr. Wharton Jones in which a patient suffered from asthenopia shortly after a railway accident, but no allusion is made to the length of time during which the changes in the fundus of the eye were observable.

The connection between injury to this portion of the spine and the changes in the eye is also shown in a case related by Sir B. Brodie,[2] and quoted by Mr. Wharton Jones. In this instance the pupil was affected, and after death a clot was found in the spinal cord at the level of the sixth cervical vertebra.

It has also been shown by Dr. Clifford Allbutt that ocular

[1] Failure of Sight from Railway and other Accidents, p. 14. Wharton Jones, 1869.

[2] Pathological and Surgical Observations relating to Injuries of the Spinal Cord. Med.-Chir. Trans., vol. xx. p. 149, 1837.

changes in connection with spinal injuries are more frequently observed in proportion as these injuries approach the head.

But amongst all the recorded cases of spinal concussion in this country, Germany, or France, no single instance is related, so far as I can discover, of early *transient* optic disc change; hence it has seemed worth while to record these cases, so as to elicit from other observers whether such changes are the general rule in cases of spinal concussion at or about the lower cervical and upper dorsal regions, since further examination can alone make it clear whether such pathological changes are the general rule, or merely a rare and exceptional coincidence.

If these changes are even to be regarded as well-established facts, it is by no means easy to determine their pathological seat or exact significance. It was shown by Budge, so far back as 1855, that if the sympathetic in the neck be cut, contraction of the pupil ensues; and as the cervical sympathetic can be traced into the spinal cord at about the level of the lower cervical and upper dorsal vertebræ, it was assumed that in the spinal cord at this spot was the centre for movement of the pupil; hence this spot received the name of the cilio-spinal centre.

It has been since shown that pupil changes can be produced by stimulating the spinal cord in various regions; hence the cilio-spinal centre of Budge can no longer be looked upon as a centre, but only as one spot in the path of an impulse whose origin is at present unknown. If this be the case, it readily explains the varied and puzzling phenomena attendant upon spinal injuries.

# CASE OF HYSTERO-EPILEPSY,

WITH

# HEMIANÆSTHESIA AND CHOREA.

BY

WALTER H. JESSOP.

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Charlotte P., aged 20, was admitted into Mary Ward on March 9, 1880, under the care of Dr. Gee, to whose kindness, and that of his House-Physician, Mr. Read, I am indebted for the use of many of these notes. Patient was educated for a pupil teacher, and enjoyed very good health till June 1875, when she had a mild attack of scarlet fever. While recovering from this, without any history of fright, she was seized with a violent fit of hysterics, lasting a quarter of an hour, and followed for some time by a comatose condition. From this time she had several fits of the same character, generally preceded, as all the subsequent ones, by a state of drowsiness.

In June 1876 she fell while standing on a chair, hit her head during the fall, and was taken home insensible. She remained so for some hours, and on emerging from this coma had several severe fits, which now altered in character. They became more violent and frequent, the patient being strongly convulsed, foaming at the mouth, often biting her tongue, and passing her urine whilst in them. Owing to their severity—the *status epilepticus* lasted once thirty hours—and their effect on her mind, she was taken to the Surrey County Asylum, and was there from July 1876 to September 1877. Dr. Biggs tells me that she was under treatment for hystero-epilepsy, and for some time wore splints, to prevent flexion of the legs on the thighs during the fits, a habit probably caught from another patient in the same ward. On dismissal she was apparently quite well, and remained so, with the exception of some slight fits, till March 1878, when, falling into a

maniacal state, barking like a dog, and thoroughly uncontrollable, she was removed to Brookwood Asylum, remaining there nine months, and returning home quite well. Thus she continued, with the exception of some slight fits in the night, and was well enough to go out as nurse in an industrial school. Here her strength was overtaxed, and on February 17, 1880, she fell down suddenly as if dead, and this was followed by severe epileptiform attacks. Since the last fall she has been unable to sit up without support to back, or to turn herself in bed, and until two days ago was unable to move her legs, or experience any sensation in them. Left arm has felt numbed, and weaker than right, and she has had some slight dysuria, but has now perfect control over bladder and rectum. The fits have rather increased than diminished in frequency and violence.

Paternal grandfather died of apoplexy. One sister has been an idiot since eighteen months old.

Patient is well educated and intelligent; of heavy expression; face flushed; no facial palsy; tongue protruded straight. Pupils equal and dilated; no strabismus.

Left eye: margin of disc indistinct; well-marked physiological pit.

Right eye: myopic crescent; disc anæmic.

No discharge from ears; fauces inflamed; right tonsil much swollen. Temp. 100° Pulse, regular, full, 88.

Pulsation apparent on right side of neck, epigastrium, and third left interspace. Systolic bruit over pulmonary artery; otherwise heart and lungs healthy.

Abdomen tender to pressure all over; marked hyperæsthesia over left ovary; pupils contract on pressing over it.

Bowels constipated. Urine, 1035; acid; no albumen, no sugar.

Catamenia irregular, began at eleven years old; were absent for five months before first fit.

Patient tested for sensation:—

Left side.—Sight: can only distinguish light from darkness.

Hearing not so good as on right side.

Taste and smell the same as right. Sensation on tongue and inner surface of mouth impaired.

Common sensation good in front to level of third rib and spine of scapula behind, on arm as far as elbow. Below elbow, over rest of left side of thorax and abdomen, and down lower extremity there is anæsthesia, analgesia, and ischæmia (except pin pierces muscles deeply). The anæsthesia, &c., on the trunk is strictly limited by the median line, and a fold of skin may be pinched up and needle passed right through it without causing any pain.

Right side.—Sight fair ; failing for five years. Hearing, smell, and taste unimpaired.

Common sensation slightly defective in leg, elsewhere good. Great hyperæsthesia over lower dorsal and lumbar spinous processes.

She cannot sit up without support, and when compelled to lean forward experiences great pain in lumbar region. Can only move left arm very imperfectly ; cannot place left hand on top of head, and grip very feeble. Both legs are moved with difficulty.

No wasting of muscles on either side, and they act well to the interrupted current; no contractions of limbs. Patella tendon reflex present in both legs.

March 18.—Hyperæsthesia not so marked over spinous processes. Movements in both legs better. Sensation over rest of body the same as on admission.

Four gold coins moistened, bandaged in ring round left leg just above ankle, and left on for twenty minutes, produced no effect. Four more gold coins placed in same way on leg a little higher up, and four others on middle third of arm. These were left on for two and a half hours with no effect. Patient did not know what was being done, as her eyes were bandaged.

20th.—Coil of zinc placed round left arm, and another round left leg; both were left on for four hours with no effect, patient seeing what was happening.

22d.—Typical epileptiform attack. About 3 A.M. strong fit; right side of face drawn ; foamed at mouth ; bit tongue badly ; was stupid and unconscious for two hours after ; passed urine under her during fit.

24th.—Area of anæsthesia spreading on left side, upper arm and shoulder being partially anæsthetic ; sensibility also defective on right side.

31st.—Complete anæsthesia on left side, also below right knee. Fits frequent and violent ; patient is menstruating.

April 6.—Silver coins placed round left arm and leg, kept on for three hours ; no effect on anæsthesia, but on pricking skin, where coins had been placed, blood was drawn, though complete ischæmia elsewhere on left side.

14th.—Anæsthesia extends three inches above right knee ; left side unaltered.

24th.—Some circular pieces of copper placed round left arm and leg for three hours with no result.

The treatment during all this time had consisted of bromide of potassium in increasing doses from 20 grs. to a drachm three times a day. The fits varied in number from one to twenty in the

twenty-four hours, most, however, at night, the pillows being often stained with blood from the tongue. In severity they had greatly diminished. The only other symptom of importance was obstinate vomiting, lasting from April 6th to the 21st. This was checked by nutritive enemata, ipecacuanha wine, arsenic, and discontinuing the bromide. On the vomiting ceasing the bromide was continued in drachm doses.

May 15.—Feels drowsy; frontal headache; four fits last night. Urine, 1026; acid; no albumen or fumes of bromine. Bromide left off, and ordered oxide of zinc five grains three times a day.

17th.—No more fits; was delirious and excited yesterday; removed for the night to Casualty; application of battery and all noisiness ceased.

May 25.—Fits continue about one a day. Zinc oxide increased to ten-grain doses.

June 9.—In consequence of vomiting after medicine, zinc oxide was stopped, and liquor strychniæ four minims ordered three times a day.

June 23.—Fits less frequent and not so severe; very little convulsed whilst in them, and rarely bites tongue.

Can feel distinctly as far as knee on right side, and indistinctly down whole leg.

July 7.—Has had no fits for some days.

*Note by Dr. Gee.*—Left arm and leg have now become highly rigid, the arm flexed at all joints, thumb drawn in upon palm, just as in Charcot's picture.[1]

The leg is extended at hip, knee, ankle, and toes, but the foot with a decided inversion of the sole, that is, varus.[2] How long this rigidity has lasted cannot be ascertained. No facial paralysis. Anæsthesia confined exactly to left side; feels well in right foot.

Functions of left ear, eye, and nose as much impaired as ever.

Irritable spine, lower part of dorsal region on left side.

No distinct ovarian tenderness or tympanites.

Menstruation irregular, sometimes only once in two or three months.

Highly marked ankle clonus in left foot.

Micturition natural.

July 29.—Eyes examined; pupils equal, dilated; no paralysis of ocular muscles.

Left eye.—Can scarcely distinguish light from darkness. Lower and inner edge of disc badly defined; veins rather enlarged. Some apparent swelling along track of vessels to lower margin of disc. Myopic crescent not so extensive as in right eye.

[1] Leçons sur les Maladies du Systême Nerveux, 4th edit., Paris, 1880, vol. i. 348.

[2] Ibid., p. 361.

Right eye.—Disc anæmic; large myopic crescent.

Can read Snellen 3 at 10 inches; with − 1.25 D can read Snellen 2 at 10 inches.

Vision = $\frac{20}{40}$; with − 3 D is $\frac{20}{30}$.

Can distinguish colours well.

July 30.—Fields of vision for colours of right eye taken by Carter's perimeter. They are all greatly curtailed, even more so than in Charcot's plate,[1] all the fields being comprised in the 20 circle.

The areas are contracted nearly concentrically according to the usual order, viz., white, blue, yellow, red; the central colours, green and purple, being only represented by one point each.

On the nasal and lower surface of the chart there is no vision for colour from 45° on the right to 90° on the left, that is, three-eighths of the whole field.

Patient was admitted into the Royal Chest Hospital, City Road, under the care of Dr. Gabbett, on September 27, 1880.

She has been staying in the country for the last seven weeks, and looks much improved by the change. Though still subject to nocturnal fits, they are very slight. One night, however, in September she had a very severe one, and on coming round, found herself lying on the floor with tongue bitten, and totally unconscious how she came there. On waking the next morning, the rigidity in left arm and hand was found much lessened. At the same time she complained of neuralgic pains in face and tingling in left extremities, followed by partial sensation and numbness. This improvement has continued up to the present time.

Patient has lost the heavy expression she had. Eyes, no change from July 27. Taste, smell, and hearing equal and good on both sides. Heart and lungs healthy. No pain, tenderness, or hyperæsthesia over spinous processes; no ovarian hyperæsthesia on pressure; catamenia regular; no anæsthesia of any part of body.

Left arm lying lax and useless by side, having lost all rigidity; no voluntary movement at shoulder or elbow-joint. Can flex wrist slightly, probably due to weight of hand; no power of extension of wrist, or of pronation and supination of forearm.

Hand generally flexed on wrist, and fingers tending to assume the same position as when contracted.

Thumb flexed at first and second joints, and lying on palm. No power of extension or opposition.

[1] Op. cit., planche ix. fig. 2, vol. i. p. 178.

Fingers generally flexed at first and second phalangeal articulations ; very feeble extension.

No rigidity of fingers or thumb.

Muscles of arm and hand not at all wasted, and respond well to faradisation.

Left leg: foot somewhat contracted and in varus position ; drags leg in walking, but not so much as before.

Sept. 30.—Yesterday and to-day patient has exhibited slight choreic movements in right arm. Says she was frightened on the night of September 25th, and has noticed right arm unsteady since.

7 P.M.—Has become much worse; can scarcely be kept in bed; movements confined to right side of body ; has had no fits. Ordered chloral and potassium bromide, 20 grs. of each.

Oct. 1.—Has scarcely slept, though had two doses of chloral draught. Movements incessant, and now comprise left leg ; face very little affected, and can protrude tongue. Heart sounds natural and pulse good.

2d.—Much worse ; very little sleep ; movements more violent, and only stop with sleep. Removed to padded bed in small ward, as she cannot be kept in bed. On careful examination, the movements are limited to the two legs and right arm when she is lying down, and comprise rhythmical extension and flexion of the limbs. During extension the limbs are rigid, then suddenly they are flexed at the several joints, and again forcibly extended.

The head executes no movements when lying down, but on attempting to rise it seems to fall about, simply as if due to want of support, and not to choreic movements. There is a tendency for body to fall over towards left side.

On waking, the limbs are first rigid, then movements begin gradually in legs, then in arms, and after a few kicks she begins continuous violent flexion and extension of limbs.

Heart's action weaker than yesterday, but general condition little affected, notwithstanding the incessant movements and want of sleep.

Pressure over ovarian region has no effect on movements, and there is no iliac tenderness.

Nitrite of amyl administered four times on handkerchief without effect. She is on large doses of chloral and bromide of potassium.

3d.—Had very little sleep ; movements still very violent and as strong as ever. Seems to suffer very little from the strain on her constitution. Has had no epileptic fits. Is very much distressed at her condition. Takes food well. Heart's action weaker, but no abnormal sounds.

From this date till the 13th there was little change. Sleep every night induced by chloral; she has been treated with arsenic, assafœtida, &c., without any effect. Takes food well. Bowels regular. No urinary troubles. Catamenia twice in last month; and present for the last four days, during which the chorea was increased in violence.

No alteration in state of left arm.

20th.—Since last note has been improving every day, the movements not being so violent, and does not now fall out of bed. The rhythmical action of the legs and arms is still maintained. Left arm is capable of a few movements; thus can flex forearm on arm, pronate and supinate forearm slightly, extend fingers better, and can grip hand feebly.

Is quite well in herself, and constitution does not seem to have suffered by the month's activity.

The only bad symptom is the insomnia, not being able to sleep without a chloral draught.

For the last fortnight she has been treated by injections beneath the fascia of the forearm of liquor sodæ arseniatis five minims three times a day without any arsenical symptoms. This preparation seems in her not to excite so much irritation as the liquor arsenicalis, probably owing to its not containing colouring matters, &c.

*Remarks.*—The patient, a well-marked case of hystero-epilepsy, dates the commencement of the fits from a slight attack of scarlet fever, unaccompanied by nephritic symptoms. According to Dr. Gowers, the scarlet fever poison probably has some peculiar effect on the nervous system, as so many cases of epilepsy, &c., date from an attack of it.[1] The fits throughout have been wanting in the *globus hystericus*, the only warning being a feeling of drowsiness.

The left anæsthesia, incomplete on admission, became complete under observation, everywhere limited by the median line; the sight, hearing, taste, smell, being also affected on the same side.

Metalloscopy had no effect whatever on the anæsthesia though persevered with; gold, silver, copper, and zinc being tried with and without patient's knowledge. The condition of ischæmia was affected once after application of silver coins, but this may have been simply mechanical, the coins being larger and heavier than the others used.

The rigidity of the left arm and contracture of the hand came on gradually, not being noticed till far advanced.

As usual, the anæsthesia and rigidities disappeared somewhat suddenly during a fit.

[1] Gulstonian Lectures on Epilepsy.

The condition of the eyes is interesting, as both are severely affected, and have not improved in the least, notwithstanding the return of sensation in all other parts. The amaurosis of left eye is nearly complete, and has not altered for six months, though no cause can be found by examination to account for it. Besides the contraction of fields of colour vision of the right eye, there is apparently a large scotoma.

With regard to the chorea, the co-ordinated movements of the legs and arm, and the fact of its occurring in a hysterical subject, seem to point to its being included under the rhythmic hysterical chorea of Charcot.

Thus, looking at the whole history of the case, it seems undoubtedly to agree with Charcot's description of hystero-epilepsy, complicated with anæsthesia, analgesia, ischæmia, paralysis, contractures, amaurosis, and lastly, chorea.

But notwithstanding this identity, the treatment so often and successfully used by him has failed. Thus neither metalloscopy nor ovarian pressure had the slightest effect on the anæsthesia, the fits, or the chorea.

It would also seem, by the slight ovarian and uterine disturbance in this case, that the starting-point of the malady was not ovarian, but rather, according to Dr. Russell Reynolds, due to general nervous derangement.[1] The nervous theory is borne out in this patient, especially by the lasting mischief to the eyes.

[1] Lancet, June 2, 1877, p. 788.

# ON UNEQUIVOCAL GOUTY DISEASE.

BY

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"A knowledge of the real nature of gout, and of its kindred malady rheumatism, is, in my opinion, at the very foundation of all sound pathology."—TODD.

"The history and nature of gout have yet to be written."—J. BEGBIE.

There can be little difficulty in making a correct diagnosis in a case of typical acute gout which has established itself in the ball of one of the great toes; and there is little less in forming an opinion as to the nature of the affection when a single joint—*e.g.*, the metacarpo-phalangeal of the thumb or forefinger—is seized with gout in the hand. These are classical cases of podagra and cheiragra, and hardly any other ailment can simulate them.[1] It is in the less well-marked instances of gouty arthritis that much hesitancy is felt in giving an opinion; and although careful attention be paid to all the points which are laid down in the best text-books, it not unfrequently is a matter of much difficulty to pronounce at once, with certainty, that true gout is at the bottom of the disturbance.

There is no doubt to be entertained in any case in which tophaceous deposits are met with, whether on the hands or the helices of the ears; but such concretions, although common enough, are very frequently absent in cases of severe and unquestionable gout.

There is, indeed, the best reason for putting on one side all cases of gout which are accompanied by manifest uratic deposits in the integuments. They constitute, I believe, a distinct clinical group.

[1] *Vide* account of a case of pyæmic abscess near the great toe in a gouty man, which closely resembled true gout at first. Clinical Lectures and Essays, by Sir James Paget, 2d edit., p. 358.

In this essay I desire to map out, as concisely as I can, the limits of true gouty disease, and to eliminate all such characters as are not warrantably due to it. I am well aware that I have set myself a hard task, but I believe that this piece of work has yet to be done; that it demands execution; and that it devolves upon English physicians more especially to make the attempt.

With the general progress of medical knowledge, it was certainly taught twenty-five years since that the rheumatic and the gouty states were to be plainly distinguished, and the term "rheumatic gout" was discarded by many, in deference to more exact clinical study and pathological research. Without question, much advance in the knowledge both of rheumatic and of gouty disease has been made during the period just mentioned, and the result has certainly been to force on the mind of the inquirer the fact that at least two pathological entities had to be dealt with in studying these forms of arthritis.

To throw the fullest light upon the whole matter, it is essential that clinical work should go hand in hand with the inquiry into the morbid anatomy, and it is equally important not to enter upon a fresh study of the question with a strong bias in favour of one or of the other view.

To attempt to decide in any given case of advanced arthritis, by the mere deformity present, as to the gouty or rheumatic element in the pathogony, will commonly prove fruitless. A patient may have had repeated attacks of true gout in an extremity for a period extending over forty years, and yet present little or no plain clinical indication in the part of the diathetic condition which underlies his constitution. Another patient is crippled for life, or has unmistakable tokens of the arthritic changes set up by a single attack of rheumatic disease. The diagnosis is made by the aid of other concomitants in each case, otherwise the exact nature of the affection remains more or less a matter of uncertainty.

In his lectures delivered at the Royal College of Surgeons last summer, Mr. Hutchinson sought to prove that attacks of pure, uncomplicated gout are very rare, and that all the gross nutritional changes in joints, affecting the various textures, are of rheumatic nature. He regards the majority of cases of arthritis, commonly considered gouty, as due to a mixed rheumatic and gouty diathesis, the latter affording the uratic deposits only, and the former inducing the bony and other deformities. He thus makes gout to play a very insignificant part in the process, but finds a place for the old term rheumatic gout as thus defined. According to this doctrine, what is commonly called gout is a malady resulting from a hybrid diathesis, partly, and very much,

rheumatic, and partly, and much less, truly gouty. Mr. Hutchinson was led to form these opinions by both clinical and pathological observations. Certain specimens found in some of the London Museums, notably one or two of Sir Benjamin Brodie's, showed uratic deposits, together with bony outgrowths and other changes in the tissues of the joints, and thus appeared to afford unequivocal proof of the presence of both gout and chronic rheumatism.

The combination of these two conditions is to be suspected, Mr. Hutchinson averred, whenever, together with manifest gouty symptoms, any bony "lips" or outgrowths were to be found at the condyles of the femora, at the bases of the metacarpal bones of the thumbs, or if the pisiform bones were found to grate upon the adjacent cuneiform ones. Mr. Hutchinson regards gouty disease as due to malnutrition, dependent only upon dietetic errors. Rheumatic disease, originally starting from rheumatic fever, he considers to be a catarrhal condition of the joints, due to an inherited neurosis. Both gout and rheumatism are inherited, but the diathesis may be modified in transmission, and a hybrid diathesis be evolved.

I believe that Mr. Hutchinson stands almost alone at the present time in holding some of these opinions. However, it is nothing to the point to state that the majority, if not all, of the observers and thinkers upon this subject are at variance with him. If all alike are only concerned to find out what is true, it is a matter of rejoicing to have cause to revise current doctrines, and to search more keenly for new facts to assist elucidation.

Gout is allowed on all hands to have a predilection for joints. Of rheumatism the same is true, but in still more marked degree. Both affections, however, may exist without any measure of arthritis. I have already tried to show this in respect of gout.[1] The common conception of either is mainly that of an inflammatory joint-affection.

Mr. Hutchinson would not allow that any disorganisation in a joint, other than that produced by uratic deposit, was gouty; therefore, according to his views, a gouty arthritis is not a very serious matter, unless the joint become much impregnated with, and crippled by, urates. I take exception to this view for several reasons.

It is still a modern view of the pathology of gout to regard the malady as not essentially arthritic. As no one will deny the common implication of joints in gout, so no one will gainsay the fact that this disorder has a marked predilection for the kidneys. Gout is allowed to be one of the chief factors in the ætiology of granular degeneration of the kidney; in short, this affection is one of the

[1] St. Bartholomew's Hospital Reports, vol. xv. p. 93, 1879.

specific portions of the malady. Other visceral changes likewise occur with marked frequency in the gouty.

We cannot proceed to investigate the condition of the affected parts by anatomy, and must therefore watch the morbid processes as they occur. It is, happily, only at the end of a long career that we can have the opportunity of studying all that gout has done to the several parts and textures of the body, and then we meet with the grossest changes, which a long course of disease has induced.

The data for what I believe to be the fair and legitimate differentiation of the two morbid affections known as osteo-arthritis and gout are to be found in a careful clinical comparison of their respective phenomena.

It would seem that the clinical features of the two diseases are very different. The one is essentially an arthritis, the other is not. Gout presents many peculiarities never observed in cases of osteo-arthritis. If this be granted, there is no reason to believe that the two affections may not occasionally become blended in the same subject; for gout is well known to modify, and be itself modified by, other diathetic conditions; as, for examples, struma, cancer, and syphilis.

There is hardly room for doubt respecting the existence of both gouty and rheumatic diathesis. Mr. Hutchinson is disposed to regard the two states as related to a primary arthritic or basic diathesis. The hereditary tendency is met with in both. Hitherto it has been supposed to be much more strongly marked in gout than in rheumatism. Mr. Hutchinson's statistics, he alleges, tend to disprove this belief. Both of these affections are exceedingly common in this country, and it is rare to meet with families who are apparently free from all taint of either.

The teaching which has prevailed during the last quarter of a century respecting gout and rheumatoid arthritis does not seem to be supported by further study of these two affections.

Dr. Garrod has endeavoured to draw the line very abruptly between the two disorders, and most modern writers have followed him. "I am convinced," he remarks, "that no combination of the two diseases is ever seen in nature."

It has been taught that the term "rheumatic-gout" is a bad one, inasmuch as the affection so designated is not to be considered as a conjunction of the two states. The decision has been made from both the clinical and the pathological aspects of the cases, and the presence or absence of uratic deposit has determined the respective relegation of them. In many instances, the broad distinctions thus laid down are warranted by facts, but in others there is plain evidence of a conjunction or coalescence of the two

affections, uratic deposition being still taken as affording evidence of the gouty part of the malady.

It would indeed be remarkable if the two disorders did not sometimes coexist. Neither is known to be prophylactic against the other, and each is certainly commingled with different morbid conditions. Hence it appears that the old and discarded term rheumatic-gout may still hold its place in nosology, but only when the particular case so named shall fairly present the features proper to each affection, and the coalescence, in some degree, be proved.

Rheumatism and gout are not very uncommon in the histories of persons who ultimately become either more gouty or more rheumatic as they grow older. Mr. Hutchinson thinks he has evidence sufficient to prove that many cases of rheumatoid arthritis—which he prefers to call chronic rheumatism—are really the outcome of original attacks of rheumatic fever; and if, in any of these, gout should be acquired or supervene, a true rheumatic-gout would result.

To the older writers, before the special relations of uric acid to gout were established, there were not the same difficulties which now present themselves. The fact of uratic deposits occurring in a disorganised joint, with bony outgrowths around, called for no special comment; their presence or absence afforded no particular clue to the nature of the case. To us, such a conjunction has a marked significance. Well-ascertained facts now warrant us in connecting a very definite clinical history with the deposition of urates. Their presence betokens true gout in any case, but not, it may be, the whole of the gouty manifestation in any given joint. I shall endeavour to show that the phenomena of gouty arthritis frequently entail something beyond the mere deposition of urates in the part. The late Dr. Gibson was of opinion that, with increasing years, there was a tendency for cases of acute rheumatism to relapse more often than in younger persons, and for the ailment to be more prolonged, and he considered that such cases tended to develop into gout.[1] In notes of Professor Laycock's lectures at Edinburgh, taken nearly twenty years ago, I find the following sentence:—"A gouty patient will probably become rheumatic." These views are noteworthy as the expression of men who so well understood the subjects they treated of, and they at once recall the theory of the *basic* diathesis common to these two affections,—"deux branches issues d'un même tronc." This is Charcot's view, and Hutchinson, as already stated,—holds the same. The children of gouty parents suffer—so it is alleged by several writers—with some frequency from acute rheumatism, and those

[1] Lancet, vol. ii., 1870, p. 219.

of rheumatic parentage often become gouty; and in the same family are found examples both of gout and of chronic rheumatism. I have not yet collated the facts bearing on this point from my own cases, but I have a decided impression that carefully made inquiries will lend much support to the view just mentioned.[1]

I propose now to set forth what, in any given case, is to be regarded as unequivocal evidence of the presence of gout. Putting aside such cases as are at once recognisable as true and uncomplicated gout, I take up the more difficult and puzzling instances which appear in the writings of various authors to furnish elements both of gout and rheumatic disease.

The broad distinctions are well laid down in many books, and every student is expected to be familiar with them, and to be ready to draw up a categorical list of the characteristics of each. But, in the test of actual practice, difficulties are not unfrequently encountered, and it thus comes to pass that an accurate diagnosis is only secured by the aid which therapeutics afford.

To mention one point by way of illustration, let the case of an example of Heberden's nodes be taken. The illustrious physician, who first directed attention to these, remarks dogmatically, that they have nothing to do with gout, and most subsequent writers agree with him. But is this really the case? The late Dr. James Begbie was convinced of their gouty nature,[2] and remarked that they are not less certain indications of the gouty habit than enlarged cervical glands, with their irregular cicatrices, are of the strumous constitution. If an appeal be made to the morbid anatomy of these little formations, it is to be expected that a decisive answer would be forthcoming, and that a confident opinion could be expressed. If they be truly gouty, the presence of uratic deposit must be assured. But no such deposit is found in Heberden's nodes. So far, then, as morbid anatomy yields an answer, they cannot be considered truly gouty. A further appeal must, however, be made to clinical observation, and the reply from this source is to the effect that Heberden's nodes are to be met with in several conditions, and are, therefore, not specifically characteristic of either pure gout or pure rheumatism. They occur, indeed, in cases of unequivocal gouty habit of body, in

[1] Noël Gueneau de Mussy regards osteo-arthritis as a sort of cousin of true gout. Pye-Smith thinks there is not evidence enough to make us believe that persons who have suffered from rheumatic fever or from chronic rheumatism are more likely to be attacked by gout, or that rheumatism and gout run in families. "They are not antagonistic, but they have no pathological relation to each other." He very truly remarks further—"Coincidence of structural changes does not imply an identity of the process which led to them." Hence the imperative necessity for clinical observation to decide the question.

[2] Contributions to Practical Medicine, Edinburgh, 1862, p. 27.

cases of rheumatic arthritis, and they also occur as a purely senile change in cases where no plainly gouty or rheumatic habit has prevailed. Moreover, they may be met with in very young subjects.

There is evidence of a greater frequency of them in the female sex; and although the more regular manifestations of gout are not so common in this as in the male sex, I believe they are sometimes amongst the indications in women of the gouty habit which they are capable of passing on in more overt form to their male progeny. They are most certainly hereditary. Nodes of this nature sometimes arise on one joint as a result of injury, and may merely indicate a past localised arthritis of prolonged duration.

The foregoing statements illustrate a point of prime importance in practical medicine, and show that there is danger of forming wrong conclusions upon the solitary evidence of any one method. Dead-house research by itself tells only part of the story of Heberden's nodes. Without doubt, nodules of uratic deposit and other little masses, sometimes like crab's eyes, situated near the ends of the fingers, have been mistaken for these nodes. They are symmetrical, and are formed by a chronic ostitis occupying the normal tubercles which are found at the distal end of these phalanges. Anchylosis may or may not exist, and the terminal phalanx is sometimes distorted to right or left. The articular cartilages may be eroded or absorbed, and eburnation may proceed on the bony ends.

To determine the full significance of Heberden's nodes, an appeal to other clinical phenomena is necessary. Thus, in women, they often coexist with hemicrania, asthma, severe headaches, menorrhagia, and other troubles which are properly recognised as gouty manifestations of the sex They may precede more overt attacks of gout by many years, and, as Charcot has shown, are not seldom met with coincidently in women the subjects of cancer of the breast and of the uterus. I have observed a stage in their formation when a crunching sensation could be elicited by pressure. Here there was evidently synovial effusion in the joint, showing itself at the points of least resistance, where the ligaments hardly enveloped it. I have never known them to give rise to any discharge, as described by Garrod.

I believe it is impossible to comprehend the specific qualities of true gouty disease without invoking the marked agency of the nervous system in determining many of its characters.

But while there may be difficulties in the way of accepting gout as a diathetic tropho-neurosis, there are still more obscurities at the present time respecting the true nature of rheumatic disease. The lactic acid theory of the latter is consigned, with

some respect, to oblivion, and we are now face to face with two theories which are struggling for predominance, so far apart, indeed, that while, on the one hand, it is taught that rheumatism is a catarrhal neurosis, on the other, it is alleged to be due to a form of malarial miasm. Mr. Hutchinson strongly promulgates the former view, and Dr. T. J. Maclagan suggests the latter, as the best explanation of the unquestionable benefits produced upon the malady by the several salts of salicylic acid. I believe that facts are not wanting to show that even the acute phases of gout are decidedly subdued by some of the salicylates, but it would be plainly wrong to urge on this account that the germ theory was applicable to gout. These remedies are of prime value in subduing active inflammatory, or, at all events, pyrectic conditions. They have hardly a place in the treatment of any of the chronic forms of either gout or rheumatism.

In any given case of gout, I hold that regard must be had to the nervous aspects of the affection. These are certainly more marked than in the phenomena presented by rheumatism in most instances. The influence of heredity goes for much in gout, and for less in rheumatism. The age at which its first manifestations occur differs materially in the two diseases, so that while children suffer with acute rheumatism, and are specially prone to carditis, gout is most frequent only during the fourth decade, and in the arthritic form is a curiosity in children. The nervous constitution of the goutily affected is different, for the most part, from that which is observed in the victims of rheumatism. "Fools do not have the gout," wrote Sydenham; and, as with the subjects of delirium tremens, it is found that the sensitive, highly organised, and accomplished, present the largest number of sufferers. *There is something in their nervous constitution which determines their being gouty, for the same conditions being applied to others not so disposed will fail to evolve goutiness.* This point has been lost sight of, but it is as certain as anything of which we are confident in practical medicine. The uric acid perturbation is but an epiphenomenon in any case, albeit a very definite and specific one.

The marked frequency of gout in the male sex is another proof of the outcome of the trouble, as the result of nervous wear and tear and highly differentiated brain-centres. I have elsewhere expressed my views as to the differences between inherited and acquired gout, and believe that both cases lend proof to the neurotic theory of gout.[1]

The sudden onset of arthritis, illustrating its so-called explosive character, is a point in favour of the gouty nature of the inflam-

[1] A Plea for the Neurotic Theory of Gout. *Brain.* April 1880.

mation in any given case. The tendency to shift is common to both gout and rheumatism, but distinctly more marked in the latter.

The elective affinity for certain joints is also common to both, but each has its favourite sites. In endeavouring to compare cases of acute gout with those of acute rheumatism, it is remarkable to find that the contrast is so much greater than in those of the chronic forms of each. A first attack of rheumatic fever is polyarthritic, and the classical first onset of gout is a monarthritis, almost certainly podagral, and in a big-toe. In the chronic forms of these affections, the stress is apt to fall on the smaller joints of the extremities, but in rheumatism with greater frequence upon one or more large joints as well.

It is probable that in both cases alike a common influence comes into action in the later stages, namely, a reflex nervous operation, so that spreading and multiple arthritis ensues from the originally affected joint or joints. This is Ord's theory,[1] and Mr. Hutchinson seems disposed to accept it.

The features of gouty and rheumatic arthritis in the acute stages are very different. The pain of gout is peculiar and *sui generis*. Those who have suffered from both maladies, or who in the course of a single illness have attacks of each (in a truly commingled case), can clearly distinguish the respective pains of each. A notable instance of this kind was lately under my care, and the man could tell, at any time, whether he was more gouty or more rheumatic.

The pain in gout is often disproportionate to the apparent degree of arthritis. This fact tends to show that there is a special nervous erethism in the gouty. They bear all pain badly, and, moreover, as shown by Sir James Paget, anything painful in itself is especially aggravated in persons of gouty habit, as is well seen in cases of cancer. *Response to every source of irritation is heightened, not, I believe, by the manifestations of the disease, but by the essential nature of the malady.* Such persons as are gouty would not be so if they did not possess, as part of their innate nervous disposition, a special intensified susceptibility, and a tendency to explosive neurotic manifestations.

The desquamation which follows gouty inflammation is not met with in rheumatism.

Much might be written respecting the metastatic tendencies of the two affections.

Of gouty endo- or peri-carditis it may truly be said we have little or no knowledge. Begbie records a case of fatal pericarditis in a lady aged twenty-seven, who was gouty, and came of a gouty family,

[1] St. Thomas's Hospital Reports, New Series, vol. iii., 1872.

and he states that he had met with at least two instances of this affection. I have never seen a case. The changes occurring in the heart, as part of the gouty cachexia, will be considered later.

There seems in gout, as Begbie has pointed out, to be greater tendency for synovial and mucous surfaces to be attacked, while in rheumatism fibrous and serous structures are more commonly attacked. Thus tonsillitis, bronchitis, urethritis, and conjunctivitis are amongst the manifestations of the gouty, while pleurisy, endo- and peri-carditis, and peritonitis are amongst the complications of rheumatism.

Pneumonia is common to both, but the clinical features are different, and most important to study. Rheumatic pneumonia is part of the process of the disorder. I have observed fewer instances of it during the past few years than formerly. It is most commonly in association with endo- or peri-carditis, and the left lung, for the same reason perhaps, is most often involved,[1] and more largely than its fellow. The left base is specially compressed by the swollen pericardium, but true consolidation takes place. Pleural effusion is the rule, and adds to the gravity and persistence of the trouble. The sputa are not rust-coloured, and herpes labialis is not present. Recovery is sometimes very rapid, at others, retarded, and especially is this the case if there be much pleural effusion.

Gouty pneumonia does not form part of the arthritic attack after the manner of a rheumatic one. The pulmonary trouble is the primary manifestation, as a rule, and the gouty nature of the process is surmised when it occurs in a person disposed to gout, and when, as sometimes happens, the lungs are suddenly relieved by metastatic migration to some joint in the foot. In such cases, the disorder may sometimes be removed by direct derivation to the big-toe joints, as by sinapisms. Herpes is not met with. Pleural effusion I believe to be most infrequent in gout, and I must deny Fraentzel's statement to the effect that attacks of pleurisy are common in gout.[2] I know not whence he gathered this experience.[3] There is evidence to show that repeated attacks of gouty pneumonia leave the lungs in unimpaired condition.

In treating of gouty pneumonia, the occurrence of the embolic form must not be omitted from consideration. This sometimes

[1] Lebert's experience coincides with this (quoted by Senator, Art. Dis. of Locomotive Apparatus, Ziemssen's Cyclopædia).

[2] *Vide* Ziemssen's Cyclopædia, vol. iv. p. 597.

[3] Begbie remarks (op. cit. p. 4), "We detect gout in many instances in pneumonia, and particularly in pleurisy." But I cannot find an instance of the latter amongst his admirably recorded cases. Garrod mentions the occurrence of a species of dry pleurisy, which may also attack the diaphragm, inducing violent spasmodic cough. Charcot thinks such cases are more probably simple pleurodynia.

ensues suddenly in cases of gouty phlebitis, when travelling thrombi become plugged in branches of the pulmonary artery.

The symptoms are plainly recognisable: pain and dyspnœa arise, and bloody sputa are expectorated. Patchy consolidation is found in one or both lungs. The condition is naturally very grave, and is liable to recur more than once in the course of the phlebitis. Perfect recovery may, however, ensue.

Much of the evidence upon which Mr. Hutchinson bases his view of the hybrid diathesis, as shown in the majority of cases of so-called rheumatic-gout, was also before the late Dr. Fuller, but he regarded the presence of uratic deposits in any case presenting the symptoms of osteo-arthritis as a mere coincidence. In particular, he had before him Brodie's specimens, upon which Mr. Hutchinson laid much stress. But the clinical histories of such cases gave indication of attacks of each disorder at different periods, and thus it happens that a diagnosis of the true conditions present is to be made during life, and not on the post-mortem table.

In respect of the morbid anatomy, however, in each case, we have to examine what results ensue. The common belief is that gout induces little beyond an inflammatory affection of the several component structures of a joint, associated with a specific uratic deposition or incrustation. The latter appears to be a permanent condition, the effects of time in removing it not being apparent.

Many cases, probably the great majority, of true gout occur in which no further morbid change of note is apparent than this chalk-like deposit in the articular cartilage. This is the most constant and specific lesion. A study of museum specimens shows that this articular deposit very often occurs without the production of tophi superficially on the extremities. There is both an infiltration into, and a deposit upon, the cartilage. If the urate be dissolved out by acetic acid, the structure of the cartilage is found to be little affected otherwise.

A certain amount of erosion is not uncommon, so that in place of the natural smooth surface, a fretted, roughened aspect is sometimes presented, and the cartilage is also found thinner than it should be.

This erosion is common in the patella and in the big-toe joints; and in the latter it has been shown by Garrod and Ord to be not infrequent as a mere senile change, affording evidence, however, of the subjection of these parts to great wear and tear, which may thus help to determine attacks of gouty inflammation.[1] The cartilages sometimes present a velvety or villous appearance.

[1] As Wilks and Moxon point out, the impress of the naked human foot upon a sandy shore well illustrates the constant shocks the great-toe joint is subject to.

Next in order, the synovial membrane suffers infiltration, or it may become fimbriated and develop "melon-seed bodies;" then the ligaments, fibro-cartilages, tendons and their sheaths become either overgrown or incrusted. Uratic deposit does not appear to take place in bone, although this material sometimes presses upon the contiguous cancellous texture when it is in large amount in any joint, the cartilage having been previously absorbed. A fact of large importance comes out from the study of truly gouty joints, and it is this, that in the majority of instances the bones do not present the marked changes which are so characteristic of rheumatic arthritis. Osteophytes are but rarely met with. Enlargements at the ends of the bones certainly occur, and, as met with most commonly in the knee, wrist, metacarpal, and phalangeal joints, can with difficulty be distinguished from the results of rheumatic arthritis in some of its less advanced stages. The small joints become knobby and distorted, are partially dislocated, the bursæ over them enlarged, and the hand and fingers are prone to be everted to the ulnar aspect of the forearm, although this last occurrence is less frequently met with than in chronic rheumatic disease.

Eversion of the great toe is apt to occur in the gouty, often leading to the production of bunion. This deformity may be sometimes due to badly fitting boots, but it should be far more common than it is if this were the only cause. The eversion is sometimes extreme, and the toes are crowded, and come to overlap one another. Careful orthopædic surgery, with properly adapted boots, and "thumb" stockings, can do a good deal for some of these troublesome cases, especially if they be treated early.

The contractions of the little finger and of the palmar fascia, met with in elderly people, are also, I believe, of gouty nature.

Gouty arthritis may proceed from a condition of *hydrops articuli*, or simple effusion, to that of ultimate anchylosis, the specific part of it being uratic infiltration. The degree of ostitis appears to be secondary in the case of gout, and primary, or more clearly part of the general specific process, in chronic rheumatic arthritis. I cannot agree with Mr. Hutchinson in the view that marked bony changes, with outgrowths, along with uratic deposit, are probably always significant of rheumatic and gouty conjunction, and I think he makes too light of the bony changes that unquestionably occur in true and uncomplicated gouty arthritis, especially if chronic.

Eburnation appears to be extremely rare as a result of gout in a joint, and, indeed, the measure of bony changes anywhere in true gout seems to be in relation both to the severity and chronicity of the attacks in the part.

The graver bony changes probably only begin after the absorption of the cartilages.[1] Dr. Bristowe asserts that the margins of the affected cartilages become irritated into overgrowths, and form nodular enlargements like those of rheumatoid arthritis. I have not, however, met with any plain post-mortem evidence in support of this. The tendency appears to be for wasting rather than for hypertrophy of cartilage. If such overgrowth occurs, it may be expected in an early rather than in a late stage of gouty arthritis. Uratic deposit seems to take place more abundantly in the upper than in the lower extremities. Dr. Todd directed attention to this fact. The cartilage is commonly incrusted throughout its entire depth.

It is not yet determined whether uratic deposit occurs only during the arthritic inflammatory process. It is never absent afterwards. I think, however, that, judging by the analogy of tophitic deposits in other parts, it is probable that intra-articular incrustation sometimes goes on quietly, and in advance of the explosive inflammatory phenomena. I believe that many of the uneasy sensations and sub-acute pains in various joints in gouty persons are thus explained, and that they often express this quiet deposition. Garrod believes that uratic infiltration may occur, and scarcely give rise to any inflammatory action.[2] According to Ord's theory of gout, the deposit is a result of local or general disintegration. "The local inflammations do not depend on deposit of urate, and the deposit is not a consequence of inflammation."[3] But he believes that excess of urate irritates the tissues, and that local inflammations or explosions are set up by local exciting causes.

It thus appears that amongst the rarer changes induced by unequivocal gout are those of the bony parts of the joints, albeit there are met with instances in which the bony changes are well marked. The question then arises, how far these are to be considered as truly gouty in their nature, or as affording evidence of conjunction with rheumatic arthritis, of which such changes are markedly significant?

Now such instances are certainly not common. Wilks and Moxon state that they "never found gouty deposit complicating advanced and characteristic rheumatic arthritis," and they think

[1] Charcot states that he has seen some examples of inveterate gout in which all the lesions of "arthrite sèche" were met with. He adds, however, "Mais ce sont là des faits exceptionnels, dont la nature est encore mal connue, et qui méritaient une étude attentive."

[2] Sir William Gull has related to me a case in which a patient became crippled by "chalky" gout, without ever suffering a twinge of pain or any inflammatory trouble.

[3] Op. cit.

it must be very rare. Pye Smith records an instance of true gout, in which there was enlargement and thickening of the edges of the patella, as in osteo-arthritis, but without any eburnation of bone, while uratic deposit was present in the cartilages. So far clinical evidence has not afforded me many opportunities of making the diagnosis of these conjoined states, and I have had regard to the points insisted upon by Mr. Hutchinson, namely, the "lips" of everted bony outgrowth at the edges of the condyles of the femora, at the base of the metacarpal bone of the thumb, and the grating elicited by pressing the pisiform against the cuneiform bones. And where I have met with these, or some of these, changes, I have not always felt warranted in declaring for the rheumatic element in respect of them; for I maintain that there is nothing unwarrantable in believing that such ostitis as is thus betokened may fairly be accepted as the outcome of unequivocal gouty arthritis. The fact that the greater number of cases in which ostitis occurs are truly rheumatic does not at all militate against the occasional presence of gouty ostitis. Why, indeed, should gouty inflammation *not* affect the bony structures of joints? Mr. Hutchinson regards the majority of cases of gout, properly so called, as instances of a hybrid affection, almost always rheumatism and gout. This I feel constrained to deny. I am disposed to believe that the implication of the bones, to the extent of eversion and overgrowth, in any case, is commensurate with the severity and frequency of the attacks of arthritis, and I should rather attribute the degree of ostitis to the grosser mechanical results entailed by the bare inflammatory process, than to anything specific in the gouty process itself. In most cases, the features of gouty arthritis are too evanescent to lead to such coarse nutritional change; the tension which seems to be necessary to induce the eversion is not sufficiently long maintained, as a rule; and the tumidity of the parts happily subsides altogether, or to a degree not entailing undue pressure upon the ends of the bones.

The effects of local injury must also be well considered in cases in which bony changes are associated with true gout. Blows and crushing injuries will set up arthritis, often very tedious, in those of gouty disposition, with more frequency, I believe, than in healthy persons.

Such a monarthritis is not uncommon in persons who afterwards have several joints affected with what can only be termed osteo-arthritis. Sometimes the originally injured joint remains the only one affected,—"single-joint rheumatism." In this way the bony changes often found in the great toe may be thus explained, for there can be no doubt of the great and constant exposure of

this joint to pressure and hurts; and the same holds good, I believe, with much frequency in the case of the distal phalangeal joints of the fingers. One variety of Heberden's nodes certainly arises from this cause, and thus the smaller joints owe some of their special liability to both gout and chronic rheumatic arthritis. Yet in almost any given instance, the type of arthritis may be surmised from other and associated features of the case. An injury will variously affect a goutily disposed individual, according to the measure of his goutiness at the time. The distinct physiognomy of the gouty, together with such signs as fleeting pains, dyspepsia, muzziness in the head, and general nervous erethism, will declare for gout, and the more certainly if there be inherited taint, or a mode of life conducive to the malady.

It seems not unlikely that in a careful study of the several issues of cases of chronic arthritis a clue may be found to the opinions already quoted of Gibson and Laycock.

For we have seen that chronicity is essential to the production of the grosser changes in all the component structures of inflamed joints. Thus it happens that the gravest changes are coextensive and coeval with the amount of inflammatory action. Eversion and bony outgrowths are perhaps usually the results of severe arthritis, entailing pressure in the joints. In the case of the rheumatic patient, the mischief arises in the synovial structures; in the gouty, it may be in the same or in the cartilages primarily; but, given the modicum of irritative provocation, and the results, whether of synovitis, chondritis, or ostitis, or of all combined, ensue in equal measure. The specificity of gout, locally recognised, is the uratic infiltration; the remaining changes, be they what they may, are in relation to the degree of the mischief occasioned by its deposition.

Hence we may hardly expect to find much crippling of joints due to unequivocal gout in young subjects, unless there be either strong proclivity, or have been severe and repeated attacks of gouty arthritis.

It has been too readily assumed, I believe, that the depressing influences of cold and damp are the causes only of rheumatic affections in joints. I cannot doubt that these are often active in eliciting local outbreaks of gout not only or exclusively articular. Thus plantar gout, and gout in the insteps and ankles, is often thus brought out, and painful affections in other parts. Spring-time and autumn, and "shifty" weather, with north-east winds, are notoriously bad seasons for the gouty, as well as for the rheumatic.

The proof of the specific goutiness in any case is to be had in other concomitant features. As Trousseau rightly observed,

"Gouty persons are very barometric," but they are also very sensitive to the degree of humidity of the atmosphere. In short, they are more than other people sensitive to most influences, and they would hardly be gouty if they were not. Could this peculiar nervous susceptibility be controlled in any way, many phases and many cases of gout would be impossible; and in treating gouty patients, attention to this overruling neurotic feature is of the highest importance. Many of the peculiarities of true gout have been so perfectly set forth by Sir James Paget in his "Clinical Lectures," that it is needless to do more here than refer to them. No writer on the subject has ever before placed on record clinical facts illustrating exactly what gout can and does do to many textures of the body, and it is certain that as yet few have learned to connect the symptoms and phases of the disorder he describes with unequivocal gout. Thus the importance of duly recognising the coalescence of gouty with other cachectic conditions is far too little regarded. Again, the influence of gonorrhœal poison upon the gouty—one so marked and peculiar—is hardly appreciated as it should be. It seems almost certain that a gouty taint is present in most cases of so-called gonorrhœal rheumatism, and the sequence of sclerotitis is especially significant. Colchicum is often useful in these cases.

For purposes of successful treatment here, it is imperative to recognise the factor of gouty tendency. Respecting the influence of gout upon the eye, the existence of some forms of iritis has been clearly made out by Hutchinson and others.[1] The former has also described a peculiar condition of hæmorrhagic retinitis, with flame-shaped patches of extravasation scattered over the fundus, unilateral commonly.

Thrombosis in the retinal vein behind the eye is suspected. The conditions set up by gout naturally predispose to such an affection, and it must be considered in relation to the vascular pressure and degeneration present in well-established cases.

The auditory apparatus is affected by gout. My colleague, Mr. Cumberbatch, assures me that no cause is more frequent amongst the upper classes in the production of deafness. He describes the appearance of the auditory meatus in the gouty as red, glazy, and as if recovering from chronic eczema.

The symptoms are gradually increasing deafness, occurring commonly in the third decade. Difficulty is first experienced in hearing conversation in society. The membrana tympani is found of a dull white colour, and thickened, with "cataractous deposits." The throat presents the coarse granular aspect so often seen in the gouty. Nothing is known with certainty of the condition of the

[1] Lawrence, Wardrop, &c. Hutchinson, Clin. Soc. Trans., vol. xi. p. 132, 1878.

middle or inner portions of the ear, and uratic deposit has not, so far as I can learn, been met with. In men who live freely, deafness is more common than it should be after the age of forty-five.

With respect to skin affections, commonly referred to gouty taint, the tendency is, I believe, somewhat to overrate their frequency. They are common enough, but it is not always easy to find undoubted gouty concomitants, even when these are rightly looked for.

The intolerable stingings and smartings that occur in the patches of gouty eczema are peculiar. The patches common on the extremities sometimes last a very short time, and seldom proceed beyond the papular stage. The itching is paroxysmal, and aggravated by certain articles of diet, which harmfully affect the gouty in other ways. I believe that the skin affections, which are rightly conceived as dependent upon an "arthritic" state, are truly gouty, and I am unacquainted with any, save perhaps some forms of the erythemata, that are fairly to be connected with the rheumatic state.[1] The absence of sweating in acute gout, and the desquamation subsequently from the affected part, may be noted in contrast to what occurs in rheumatism. The smooth state of the skin induced by gout is remarkable, and not met with in chronic rheumatic arthritis. It would well-nigh suffice to enumerate the well-known physiognomical features of those who either have inherited or acquired gout to satisfy any one of the contrast afforded by a corresponding study of the same in cases of chronic rheumatic arthritis.

Thus the complexion of the gouty, while often florid, is, certainly in towns, more often what is termed "mixed." The capillaries are commonly dilated, and visible when closely looked for, both on the ears, cheeks, and nose, but a good deal of sallowness is often present with this. The worst cases of chronic rheumatic arthritis have not seldom a purely sallow and almost anæmic aspect. The hair is apt to became grey early in gout, but it is common to see very gouty persons of sixty and seventy with but few white hairs. The hair certainly falls a good deal about the vertex in gouty young men, and this may begin before thirty. Doubtless errors have crept into all past dogmatic teachings upon the subject of physiognomy, because sufficient regard has not been had to the modifying influences of commingled diathetic and cachectic states. The teeth in the gouty are generally strong and well enamelled. In the aged they are often found much worn

[1] Erythema nodosum, E. multiforme, *variety*—hæmorrhagicum (peliosis). The more common gouty forms are eczema, psoriasis, and urticaria. Erysipelas was noted by Gregory of Edinburgh to be common in women whose parents were gouty.

down, and tartar is very apt to collect about their roots. I think absorption of the alveolar processes is specially apt to occur in the gouty, leading to the loss of perfectly sound teeth, which fall out.

In well-marked cases, the nails are certainly found to be lineated or vertically fluted. Transverse grooved markings are frequently found to correspond with previous acute attacks of the disorder, and these may be seen to be localised sometimes to the particular nails of the affected digits. The substance of the nail seems also to be more brittle than is natural. Sometimes the nails are cast off after severe local attacks.

If we follow the signs of gout along the digestive tract, many features are met with which are peculiar to it, and which do not form part of the clinical picture in cases of rheumatic or other forms of arthritis. Perhaps one of the most marked features in the gouty is the inability to digest certain articles of diet, both solid and fluid. Few disorders are better controlled by wise dietetic precautions. These peculiarities are too well known to need any definite statements here.

The tendency to cardialgia, with acid eructations, is one of the earliest dyspeptic indications, and often precedes, by many years, the appearance of any more overt gouty symptoms. The digestive capacity is usually vigorous till the third decade. Nocturnal dyspepsia then begins, and one article of diet after another has to be given up. The digestion is then good for what is termed "plain" food, but excess of saccharine, starchy, and acid matters is pretty sure to disagree.

The so-called cases of gout in the stomach must be very rare. Attacks of severe pain at the epigastrium, with vomiting, sometimes bloody, small pulse, and syncopal tendency, have been observed. These symptoms have suddenly yielded upon the invasion of some distant part with regular gouty inflammation, and the probability is large that, as Sir Thomas Watson suggests, the attack is determined by irritating food or over-indulgence, which simply supplies the local stimulus in parts already prone to take on this special morbid action. Other cases occur, however, in which this explanation will not hold good. Such an one was recorded by Dr. Moxon, in which erosion of the mucous membrane was found, with submucous hæmorrhages and adherent pellicles of lymph,[1] and I have knowledge of another in which the symptoms were very severe, with hæmatemesis, evidently arising from erosion. The patient, aged forty-two, had had regular gout, and inherited it from his father. The diagnosis was agreed in by Charcot in this case.

A marked tendency to hepatic disturbance exists. Pain and

[1] Trans. Patholog. Soc., 1870.

fulness are felt in the liver, and tight, constricting sensations around the thorax and in the right or left shoulder are experienced. With all this, the tongue may be clean, and sufficient bile may colour the excreta. Such trouble will better yield to restricted diet and open-air exercise than to calomel. But the latter is unsurpassed in usefulness when the tongue is foul in its posterior aspect and headache is present. Chilly and damp weather will often suffice to vex the liver in this fashion, irrespective of dietetic error, in the goutily disposed. I believe that the children of the gouty often present these symptoms of liver derangement, accompanied with vomiting, in marked degree, and calomel, with regulated diet, is the best treatment for them. Many young gouty adults are subject to oxaluria, which may intermit with lithuria. Regulated diet and open-air life best remove these troubles. The liver does not appear to suffer especially from any textural changes due to gout. If cirrhosis is met with, it is due to the alcoholic misuse which set up and aggravated the gout.[1] The occurrence of piles, too, is but part of the stress thrown upon the portal circulation by overeating or constipation, which are not, of course, peculiar to gouty subjects. Biliary calculi are met with in the gouty. The appearances in the mouth are now well recognised; thus, the large tongue, the glossy red fauces, and glairy elongated uvula are very common. Œsophagismus is sometimes met with,[2] and angina faucium.[3] Fat is prone to accumulate in the abdomen, and to add to the general venous plethora of that cavity.

What does true gout do to the respiratory tract? Bronchitis naturally claims a prominent place amongst the troubles met with here. A troublesome, hawking cough is common in the gouty, and results from irritation in the faucus and pharynx, which are seen to be coarsely granular. A tough, pearly mucus is secreted. Sometimes a laryngeal catarrh appears to be of gouty origin. Hoarse voice and discomfort arise, and on examination, patches of congestion are found on the vocal chords. This is presumably gouty when it occurs in a person subject to capricious, subacute, gouty seizures in various parts of the body, and suddenly arises without any overt exposure to the ordinary causes of catarrh. Uratic deposit is occasionally found on the arytenoid cartilages.

[1] Murchison, however, relates a case of interstitial hepatitis in a girl aged twelve, which ended in cirrhosis. There was history of gout on both sides of the family.

[2] Garrod, Brinton. I have notes of a case in which, in a gouty man, severe and painful dysphagia occurred, with spasms of the pharynx. The attacks recurred occasionally for two months.

[3] One-sided tonsillitis (Wunderlich). *Vide* a case recorded by Niemeyer, "Text-Book of Practical Medicine," vol. ii. p. 501.

Severe cough sometimes precedes and accompanies gout. Chronic bronchitis, leading to emphysema, with asthmatic attacks, is perhaps the most constant respiratory trouble. But it must not be considered as a distinct ailment, for it forms part of the degenerative process, which is widely spread in chronic gout, and has probably much dependence upon vascular changes within the lungs. These, again, are but part of more general vascular degenerations common in the gouty. Tubercular deposits occur, but the changes associated with them are certainly kept in check in a peculiar manner, so that such cases are mostly very chronic, the gouty diathesis exercising an inhibitory influence upon the tubercular, even when the two are commingled. Sometimes attacks of spasmodic asthma alternate with fits of articular gout.

Respecting the changes wrought by gout in the heart and circulatory system, much has been written in recent years. The cardiac and vascular troubles are of two kinds, functional and organic, but both are certainly due to the effects of gouty poison.

Under the first head come palpitation and irregular action, with throbbings and undue pulsations in the large vessels. It is doubtful if any marked organic changes ensue in the cavities or valves of the heart before some measure of renal degeneration is set up. When the latter condition occurs, the changes common to fibrosis of those organs follow, namely, hypertrophy of the left ventricle, mitral incompetence, progressive atheroma and dilatation of the aorta, arterial sclerosis, and loss of elasticity in the finer vessels.

Fatty degeneration appears to supervene with some frequency in the gouty, and is, no doubt, in relation to atheroma of the coronary arteries. Angina pectoris may be associated with this state.

The troubles due to increased vascular tension follow. The veins become dilated and full. Marked tendency to phlebitis is a well-established part of gouty pathology, proneness to clot being common, and inflammatory change in the coats of the veins provoked by trifling causes. Manifest attacks of gout thus express and expend themselves, the two common factors of all such seizures being present, namely, the peculiar condition of the blood, hyperinotic, and charged with peccant matter, and the veins themselves the seat of recent injury or unwonted local irritation.

The action of the heart has been observed to become regular during acute attacks of gout, where irregularity has prevailed in the intervals.

The intimate changes in the blood of the gouty have yet to be worked out. Extreme anæmia may be met with after hæmorrhages, which occur from the nose or from piles, in the gouty. Venesection is found to be bad practice in the treatment of acute gout, and fresh attacks have followed it (Todd). The articular affections which form part of the hæmophilic diathesis have been sometimes confounded with gout, and many points in the history of these cases show noteworthy alliance with gout, such, for example, as the periodical recurrence of bleedings upon slight provocation. Dr. Barlow has related to me a case of a young man who had hæmophilia, with epistaxis, hæmaturia, and effusions into his joints, and who became the subject of tophi on the ears. Schlieman, quoted by Legg, regards hæmophilia as intermediate between gout and scrofula. Legg, however, denies the existence of any alliance between hæmophilia and gout, but he admits that, as in gout and some other affections, women may pass on hæmophilia to their sons, though themselves exempt. I doubt, however, whether such complete freedom from all gouty manifestations really exists in women who thus transmit gout. I believe such signs may be found, if looked for, in some part of their life history. Their ailments are not necessarily arthritic, but, together with their degenerative tendencies, are of gouty type, and true gout may only come out at a very advanced age in such persons. Epistaxis and other forms of hæmorrhage are common in the children of gouty parentage.

It is hardly necessary to do more than refer to the intimate and specific connection between gout and renal disturbance. I employ the term "specific" advisedly, because it may be stated with certainty that no other arthritic affection is plainly associated with such forms of interstitial nephritis as result in small, hard, red, and granular kidney. I think it unwarrantable to speak of the granular as the *gouty* kidney, for here, as elsewhere, the *truly* specific part of the latter is uratic infiltration, in any given case in an adult, usually at the free ends of the straight tubes. Such deposit is also found sometimes in the same situation in the kidneys of still-born children, owning, of course, a very different ætiology. I believe that renal degeneration is amongst the earliest changes in true gout. The evidence of this is clinical, and the symptoms intermit, and are precisely, or not very unlike, those which are presented in the more common forms of interstitial nephritis. The watery part of the urine is increased, the solids are diminished, fleeting and very slight albuminuria occurs. A measure of renal inadequacy arises, and the tendency is for the mischief to progress.

In the often-combined conditions of saturnine and gouty taint,

the symptoms are more strongly marked. Lumbar pain accompanies the polyuria of the later stages. We find nothing of this kind in rheumatic people, and no special relation between lead taint and rheumatism. The cotemporary changes in the capillary and arterial tunics, leading to hypertrophy of the left ventricle of the heart, with high blood-pressure, make progress and induce well-recognised features of the gouty diathesis. The renal and cardio-vascular degenerations must always be considered together, along with the necessary trophic changes dependent upon them. We must not, therefore, so much think of a patient as having got the gout as of the gout having got the patient, and so modifying specifically all his life history. This much is, of course, true of all cachexiæ.

The gouty troubles of the urinary system are as specific as any others. Rheumatic disease works no such mischief, and hence we find no history of gravel, renal calculi, cystitis, or urethritis in the purely rheumatic. Gouty taint may modify these ailments even when they own other primary causes, as shown by Sir James Paget.

Urethral stricture, due to fibroid change in the textures of the penis, must be regarded as a gouty lesion sometimes, and thrombosis, in the form of knotty masses, certainly occurs here.

In women, too little heed has been paid to gouty affections of the uterus.

James Begbie, Sir James Simpson, and Spencer Wells have, however, well treated this subject, and shown how menorrhagia, metritis, with severe leucorrhœa and much pain, are significant of this influence, and my own observations tend to confirm their teaching.

These troubles are common in the third and fourth decades. At an earlier period may be found amenorrhœa, with profuse vicarious epistaxis, or severe dysmenorrhœa. The evidence of gout is not far to seek in such cases, for commonly there is strongly marked inheritance of the gouty influence, only it is not sought for or is taken no note of, either because of the sex of the patient or because there is no overt arthritic manifestation.

The lymphatic system appears to be singularly free from disturbance in the purely gouty. I have fully confirmed Sir James Paget's observations in respect to this immunity. I have only as yet met with secondary glandular enlargements in cases of cancer in the gouty. The same might be said, I believe, of rheumatism, which appears also to leave this system untouched, at all events in any noteworthy degree.

To try and tell what is known and what is not yet known with any certainty as to gout and its influence on the nervous system, is

a task too large and too enticing to begin in this paper. I have elsewhere made an effort to support the view that the whole malady has its origin in some highly organised nerve centre, and that it is very distinctly a neurosis. Be this as it may, can we point to any plain lesions of the nervous system wrought by unequivocal gouty influence?

In the piles of literature on this most interesting malady I can gather but very little that is certain or even noteworthy. And that it should be possible to state this, seems ground for the belief that such lesions must either be very rare or be beyond the limits of such methods of inquiry as have as yet been addressed to the subject.

Functional disturbances, so called, are common, and I suppose few now believe that these are unconnected with trophic, even if temporary, change. Thus neuralgia is well marked. I place occipital neuralgia in the forefront of typical gouty nerve disturbance, chiefly right-sided. Sciatica may rank next, but it is almost certain that changes occur in the sheaths of the nerve, more or less inflammatory. How far cramps may be fairly considered nervous phenomena, I am not prepared to state. They are very common in the gouty. More plainly indicative of central irritation are such symptoms as tooth-grinding and somnambulism in the children of the gouty, of which I have known several examples. Local paralysis is certainly met with and spasms. Buzzard gives particulars of a case in a gouty man in which undue electrical irritability of the median nerve was found, the symptoms being difficulty of writing and spasm of the hand. Recovery followed antigouty medication. Headaches are common, and hemicrania is often the expression of gout in women. Rolleston hazards, as an explanation of such headaches, the conjecture that after great mental effort or worry, the worn-down nervous matter may come to act as a poison, especially affecting the sympathetic system, leading to palsy of it, with the phenomena of a nerve-storm. These headaches may be periodic and suddenly give way on supervention of regular gout elsewhere.

Paralysed limbs, it was alleged by Leared, are seldom the seat of gout. I have no evidence as to this.

Vertigo is well recognised as an occasional gouty symptom.

Hysteria is certainly observed to be more frequent in women who inherit gout, and hypochondriasis in males.

Free urination before the onset of gout has been noted. Scudamore has reported this, and I have witnessed a remarkable instance in which diuresis preceded a severe attack in both feet, whereupon the urine became scanty, and presented the usual "febrile characters.

In relation to the nervous system in gout must also be considered the occurrence of glycosuria. Perhaps no fact more strongly illustrates the true dependence of gout upon a central nerve disturbance than this. That glucose should, as it does, alternate with uric acid production in many cases, points markedly to the nervous origin of gout.

The occasional ravenous appetite at the onset of attacks may be regarded as a nervous symptom.

Some of the phenomena reckoned "nervous" in the gouty may own the condition described by Ball as ischæmia. Temporary spasm of the smaller vessels may thus account for the vertigo and perverted sensations experienced. Arterial spasm, as in the case of "dead fingers," is acknowledged to be not uncommon in some gouty persons. These form part of the clinical pathology of this affection, and in all maladies we should be prepared to recognise this part of their nature. Dead-house research leaves much unexplained in most cases.

Apoplexy is in relation to vascular degeneration, which is so common.

Convulsive affections may be significant of undeveloped or irregular gout, and may yield to supervention of attacks of arthritis. In past times these have doubtless been unrecognised instances of uræmia, dependent on renal degeneration. Arterial spasm may explain some of these, but the blood is, in any case, charged with peccant matters.

Gouty mania occurs. Exposure to cold or to mental excitement has commonly preceded this. The whole of a gouty attack may, I believe, expend itself sometimes in a frightful attack of rage and irascibility. The conditions determining so-called cerebral rheumatism are as different as the phenomena of it.

Gouty affections of the spinal marrow are, as yet, not understood. They are surely rare, and uratic deposits have not been discovered on the meninges. Some cases of pain in the spine, with hyperæsthesia have been described, in which these symptoms yielded to attacks of regular gout.

By the light of recent researches on the several forms of myelitis, one must be very careful in declaring for gout, having regard to the possible occurrence of neuro-arthritis as part of the phenomena of their course.

Bony changes in the spinal column can hardly be said to be due to truly gouty influence. The worst examples of spondylitis are now recognised to be associated with gonorrhœal rheumatism, and thus, in any given case, attention should be directed with this point of its possible ætiology in view.

Here I must close. I have striven to fulfil the task I set myself,

and have made the attempt to map out the various lesions, all over the body, which may be fairly and honestly set down to unequivocal gouty disease. I hope I have not overstrained my case. I am fully conscious of many omissions and of much incompleteness in this endeavour.

Continued study, not of gout alone, but of all disease, as it happily comes before one in a large general hospital, together with the many-sided and varied experiences which such unbiassed study must bring with it, will certainly help to render one's views more exact, and, at all events, to rescue them from the narrowness inevitably pertaining to a special devotion to any one isolated subject. A particular charm attaches to the study of gout, because the subject is so large in itself, and because it bears the closest relations to so many other important and widely spread ailments. The field is rich, and there is room for many workers in it.

COMMENTS ON

# THE AFTER-TREATMENT OF CATARACT.

BY

HENRY POWER.

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At the last meeting of the Ophthalmological Section at Cambridge in the present year, a very interesting discussion incidentally arose respecting the method of treatment now usually adopted after the performance of the operation for the extraction of cataract, and in the course of this discussion it plainly appeared that the practice of different surgeons varies in a very remarkable degree, some applying bandages, others dispensing with them; some who used them employing them wet, others dry; some endeavouring to prevent the occurrence of inflammation by low diet and other antiphlogistic measures, others being satisfied to wait till the symptoms of inflammation are apparent before attempting to combat them; some examining the eye in a few hours, others allowing the bandages first applied to remain for a day or two, others till recovery has taken place; some opening the lids early, others carefully avoiding all disturbance of the eye till well assured that union of the wound had taken place; some instilling atropine just after the operation but not again, others employing it daily, whilst some use eserine.

In view of these differences of procedure, I have thought it might be useful to draw up a short record of the methods, present and past, adopted by some of the best-known ophthalmic surgeons of this and other countries, to comment on any singularities they present, and to give the method I adopt myself.

It is unnecessary to reproduce the statements made by many of the older surgeons, because they practised either couching or discission, and their method of treatment, therefore, had but little reference to the presence of a cut which it is of the greatest importance to keep closed, but was essentially directed to the prevention of inflammation and to the avoidance of the reposition of the

lens. The general observations they made may, however, just be alluded to.

The oldest English author on ophthalmic surgery with whom I am acquainted, R. Bannister, who wrote in 1622, and who practised couching in preference to other methods, makes the following observations in regard to the after-treatment:—After withdrawing the needle, "lay," he says, "within the eye the white of an egge, with a linnen cloth folded together, and without apply something to prevent inflammation, with a roller binding it up. These things ended, the sicke party must remain quiet without stirring, lying in his bed, without moving his head any way, or very little, not seeing any great light for a certaine time, abstaining from meate, supping onely thinne broth by the space of six or seven dayes, without chewing any meat with his teeth, because it might draw down humours to the eye and make the cataract ascend againe. When the inflammation is ceased, you shall order the patient as if hee were grievously wounded. Hee may not bee dressed, nor the eye unrolled, untill the second or third day after the couching of the cataract, vnlesse there happen any inflammation or great paine, when you will dresse it; shut the windowes and set a candle lighted behind him and not before his eyes, or rather farre off from him on the side, lest the great light suddenly offered to his sight may trouble the eye and stir up the cataract." These directions are sound enough, and differ but little from those that would now be given. The application of the white of an egg with a linen cloth is surely a foreshadowing of modern antiseptic surgery, at least it would so act.

The only operator of note between the time of Bannister and the time when Heister wrote is Daviel,[1] who, in 1752, had operated on 206 eyes in a manner closely resembling the method of Beer. Daviel, when the cataract had been removed, put the patient immediately to bed; kept him wholly from the light and as still as possible, and tied him down to the strictest regimen. An eye-water was often applied to the eye; but if it was inflamed, a fomentation was sometimes used, and the patient occasionally let blood.

Heister (1769), the great authority of the last century, only describes couching with the needle, and the use of external or internal remedies. He just mentions that Taylor stated he could extract cataract situated behind the iris by incision, but he evidently doubts it.

Jonathan Wathen[2] states, that after completion of the extrac-

[1] Mem. de l'Acad. Roy. du Chirurgie, t. ii. p. 337.

[2] A dissertation on the "Theory and Cure of Cataract," in which the practice of extraction is supported. London, 1785.

tion, the eyelids are to be closed and a plaster of some simple cerate, spread upon lint is to be laid over them, which is to be covered with thin bolsters made of some fine old linen, and the whole to be fastened by a cloth pinned round the head, so as to lie upon the eye but not in the least to compress it. The patient is then to be conveyed to bed, where he is to be laid upon his back, with the head nearly as low as the rest of the body. The pledget is to be taken off once a day, when the eyelids are to be gently washed with a little cold water, which is always agreeable to the patient, and then dried with a soft cloth, and fresh dressing to be applied as before.

"The pure aqueous humour is generally seen to flow plentifully for the first two or three days; and as this flux lessens, the discharge from the eye becomes thicker, and constantly increases in tenacity as it diminishes in its quantity. This appearance may continue for the space of six, eight, or even twelve days; so uncertain is the period of its final termination; but it always gradually decreases, more or less. Whenever this discharge wholly ceases, whether in a shorter or longer time after the operation, the eye may be inspected; at which time, should nothing more be perceived than a thickness of the edges of the wound in the cornea, and that they are in contact, it may with good reason be concluded, that all is right. A variation of the posture may now be allowed, such as sitting up in bed or in a chair. In a week more, the plaster may be omitted, and a shade substituted in its stead, when the eye is to be frequently washed with some cooling water; and so much light may be admitted as can be borne without uneasiness."

Wathen's recommendation savours of over-care. The aqueous does not ordinarily escape for two or three days, as is easily demonstrated by the presence of the anterior chamber, and the length of time he allowed to elapse before examining the eye is in striking contrast with the proceedings of Von Gräfe, who examined the eye on the day following the operation.

T. G. Beer, according to Arlt, simply closed both eyes with strips of court-plaster, and placed over these two flaps of linen kept in position by a bandage round the forehead. He found the wound securely closed on the day following the operation, and, when the patients were reasonable, allowed them to sit up for an hour or two in the morning and evening. The food he thought should be soft and nutritious, not windy, and spirituous liquors need not be entirely withheld.

Scarpa[1] devoted himself entirely to the practice of depression,

[1] Practical Observations on the Principal Diseases of the Eyes, translated by Briggs, 1806.

and his work consequently contains no observations of importance in regard to the after-treatment in cases of extraction. He appears in ordinary cases only to have placed a piece of dry linen over the eye. When heat and pain were complained of, he used a compress of soft lint dipped in the white of an egg and rose-water, beaten to a froth, with a small piece of alum. If, notwithstanding this, the pain and tumefaction of the eyelids increased, he covered the eye with bags of emollient herbs, and by these, as well as by general remedies, endeavoured to prevent the progress of the inflammation. If vomiting, headache, and shivering occurred, he administered a clyster consisting of 8 oz. of the infusion of camomile, with 2 grains of opium dissolved in it. He kept his patients on very low diet, giving only broths for the first twenty-four hours, except in elderly and debilitated persons. He did not open the eye till the third day after the operation.

Adams of Exeter [1] adopted the needle operation, but instead of couching like Scarpa, he broke up the lens, and endeavoured to place the fragments in the anterior chamber. He states that he operated on forty patients consecutively without a single failure.

The chief remarks that are worthy of notice by Weller [2] are, that just before the application of the bandage particular care should be taken that the eye be not closed until the flap of the cornea lie correctly, so that neither the edge of the under eyelid nor its cilia may cause a gap of the flap, and thus prevent the quick union of the semicircular incision. A small slip of court-plaster, which is laid perpendicularly upon the eyelids, and a double linen compress, which covers the eye and is fixed upon the brow only, constitutes the whole dressing. After both eyes have been dressed in this manner, the patient is to be put to bed, to lie with his head pretty high and with his chamber darkened. The union of the incision sometimes takes place in twenty-four hours, when the eye has been well dressed; for the most part, however, it requires from three to four days. So long as the union has not taken place the aqueous humour continues to run out, which is always made known by slight, uneasy pricking in the eye accompanied with momentary delusive feelings of light. The eye is not to be opened before this has ceased two or three days, therefore seldom before the fifth or sixth day. The bandage may be removed on the eighth, ninth, or tenth day, and a green shade substituted, and the patient is still to remain in a dark chamber; soon after he

[1] Adam's Practical Observations, &c., 1812.

[2] A Manual of the Diseases of the Human Eye, translated by George Monteath, 1821, vol. ii. p. 9.

must be gradually accustomed to a brighter light and fresh air. The diet after the operation is, of course, to be very spare. The patient is to have only thin soups, weak drinks, but no animal food. Should he have no stool before the fourth day after the operation, a gentle laxative will be very proper.

Travers[1] has very few observations on the after-treatment of cataract extraction, but this perhaps may be due to the fact that he takes for granted the surgeon will take proper care that no disturbance of the lips of the wound takes place. He says only, "The more or less inflammation which follows the operation is, of course, dependent in great measure upon the habit of body. The patient should be well purged and live abstemiously for a short time previous to it. If disposed to fulness of the vessels of the head, cupping may be premised the day before the operation. It is a matter of some importance to examine the section and adjust it accurately before finally closing the eye. I think that it is useful to let the patient rest for a few minutes with his eye closed, and then direct him to open it two or three times successively. A slight friction of the lids assists the pupil to recover its figure and dissipates any small floating particles of lens. The sitting posture in an easy-chair is most favourable after the operation until the patient feels fatigued and desires to go to bed. Confinement to bed produces great restlessness, and is of no advantage to persons not constitutionally ill. If the patient complains of pain on the evening of the day of operation, a full blood-letting removes it, and should not be omitted. I never give opiates. A light bandage passed round the nightcap and fastened to it is a sufficient covering for the eyes. Compresses on the eyelids are generally better omitted; the bandage may in most cases be laid aside on the second or third day, and a deep black shade substituted for it. During the night, however, the bandage should be applied for the first week to prevent the accident of rubbing the eyes in sleep."

Some of these recommendations are good, others are bad. The recommendation to clear the bowels is good, and I remember a case in point. I operated many years ago on a stout and flabby lady who had spent much time in India. Considerable inflammation, though not fatal to vision, occurred. A year or two after, her brother, an Indian surgeon, came home, and insisted on the second eye being operated upon. I told him what had occurred after the first operation, when he said, "I will prevent that by a purge." He gave her a pill containing croton oil, gamboge, and colocynth, followed by a black-draught. The effects astonished the old lady herself, for she told me she really thought a bucket-

[1] Synopsis of the Diseases of the Eye, 3d ed., 1824.

ful of excreta had been expelled. No inflammation followed the second operation.

We perhaps carry confinement to bed a little too far in these days, and Traver's advice to allow the patient to sit up might in many cases be advantageously followed. On the other hand, the permission to use the eye on the third or fourth day is undoubtedly injudicious, as the wound is not at that time by any means firmly closed, and the slightest pressure on or squeezing of the lids might readily lead to prolapse of the iris, or even to loss of vision.

Joseph Henry Green[1] speaking of the after-treatment of the operation of couching, observes that "the after-treatment is very simple, and consists in a single fold of linen moistened in cold water being applied to the eye. The patient is also to be put in a dark apartment and narrowly watched, in order to see if inflammation supervenes; very frequently none arises." In his remarks on the after-treatment of the operation of extraction, he says the object of the operator should be "as far as possible to prevent inflammation; a compress of fine linen or cambric kept wet with cold water should be applied to the eyes, or rather to the eye opposite to that which has been operated upon." A very singular direction. "It should be fixed by means of a bandage carried round the occiput, crossed in front and pinned to the sides of the night-cap. The patient should be carried to bed after the operation, placed in the recumbent position with his head a little elevated, and the room should be darkened. He should be allowed nothing but barley-water, tea, or water-gruel for the first few days, and if there should be any symptoms of inflammation, such as pain, a sensation as if there were some external body in the eye, accompanied by quickening of pulse, a quantity of blood should be immediately taken away from the arm. It will be better not to disturb the bandage or raise the lid to examine the eye for at least three days, unless the patient should feel any considerable pain or irritation, for in that case it would be advisable to ascertain the cause by examining the eye. The patient should be kept in bed in the recumbent position for five days, and not even be suffered to rise for the evacuation of his fæces; a bedpan should be used for that purpose. At the end of that time he may get up to have his bed made. The best way of preventing irritation is carefully to avoid making any undue pressure on the globe of the eye. Great care must be taken in adjusting the bandage not to depress the lower lid, by which means the section of the cornea" (Green adopted the section of the lower half of the cornea) "may be brought over, and the adaptation of the cut edges be prevented.

[1] Lectures on the Diseases of the Eye, 9th ed., 1836.

Loose eyelashes are sometimes a source of irritation, and it will be right to examine whether there are any such before the operation. If there should be any tendency to inversion of the lid, you may prevent the lid from rubbing against the surface of the globe by means of a bit of adhesive plaster fastened to the cheek."

The general adoption of extraction in preference to reclination or solution by all modern surgeons, and the frequent loss of the eye from prolapse of the iris, and the proceedings that were required to relieve that condition, have led to the greatest attention being paid to the after-treatment; and amongst the other merits of Von Gräfe, not the least were the rules he laid down and practised on this point, and which are now, with few exceptions, in common use.

Richard Middlemore,[1] one of the most sensible writers on ophthalmic surgery in our language, says, "The mode of dressing the eyes after an operation for extraction is entitled to great attention. When the surgeon has removed the lens and its capsule as far as he is able, or as far as he deems it advisable, and ascertained the clearness of the pupil, he should carefully adjust the divided edges of the cornea by slightly and carefully rubbing on its surface the grooved end of the curette, and afterwards moving the upper lid upon the globe; then having directed the patient to turn the eye upwards, cautiously close the palpebræ after having observed that none of the cilia are inverted, and extracting any which have the slightest tendency to turn inwards. It is necessary to raise the upper lid from the globe, draw it downwards and place its tarsal margin in accurate apposition with that of the inferior palpebra. I am in the habit of placing over them, first, a square piece of linen, upon which a little spermaceti ointment has been smeared, and afterwards a thin fold of linen soaked in cold water, which is bound upon the eye (not so as to produce firm compression) with a little roller about an inch and a quarter broad, which may be secured to a slightly elastic cap, which has been previously placed upon the patient's head. This bandage should be allowed to remain for at least seventy-two hours from the time of its application, when it may be removed, and a similar bandage applied in a similar manner without severing the lids. On the following day, or (if the eyes are perfectly easy and the bandages not at all disturbed) the day but one afterwards, the dressing may be removed, the discharge which had accumulated at and around the tarsal margins cleared away, and the lids carefully separated without disturbing the edges of the wound, in order to ascertain the state of the divided edges of the cornea and of the eye generally. An

[1] A Treatise on the Diseases of the Eye, vol. ii. 1835, p. 143.

examination of this kind, if carefully and promptly conducted (of course the eye must not be exposed to the prolonged influence of light during this examination), ought to furnish us at least with information—1. Respecting the direction of the cilia in reference to the globe; 2. the condition of the tarsal margins; 3. the state and characters of the wound of the cornea; 4. the figure and condition of the pupil; and, 5. the state of the eyeball generally, or of its separate tunics in relation to inflammation. Presuming that there is very little inflammation of the eye, that the edges of the incised cornea are in perfect apposition, and that the wound is healing or has healed as it should do, and that the cornea is clear, you would replace the bandages and change them daily for a week, when, if the case go on favourably, you need not continue any support to the eyeball, but simply direct the patient to wear a four-stringed bandage."

Mackenzie (1844),[1] in the short section he devotes to after-treatment, says, "The room in which the patient is to sleep after this operation should be large and well aired, with a temperature of from 50° to 55° F., and free from cold draughts. The patient ought neither to be loaded with unnecessary bedclothes nor exposed to cold from their deficiency. He may lie either upon his back or on the side opposite to that of the eye which has been operated on. He should be put to bed with as little movement of the head and body as possible. The room is not to be made too dark, but is to be kept perfectly quiet in order to avoid all causes of sudden alarm or starting." *Apropos* of this, I may mention a case, one of the few in which I have practised couching. The lady was about sixty years of age. The operation had been satisfactorily completed, and the lens was invisible. She was left alone for a few moments, when unfortunately a cat leaped from a balcony upon a rickety wire flower-stand loaded with flower-pots. The whole stand fell with a very startling noise. The old lady, with her eyes bandaged, and already sufficiently excited with the operation, thought the house was coming down, and jumped up from the sofa on which she was resting, and I had the mortification of finding that the lens again entirely obstructed the pupil. After some time I repeated the operation with success, but she lost the eye from cold two years after. The second eye, treated also by reclination, did well, and lasted her for ten years—indeed, until she died. Mackenzie continues, "All unnecessary talking between the patient and those about him is to be prevented. A careful assistant or experienced nurse ought attentively to watch the patient when he wakes, taking care especially that he does not turn suddenly round upon the eye which has been cut, or put up his hand

[1] A Practical Treatise on Diseases of the Eye, 4th ed., 1854.

to rub the eye. If there is any particular reason to dread the latter accident, it may be proper to muffle the patient's hands and pin them together or down by his sides.

"It is rarely the case that the patient complains much of pain during the first few hours after the operation. If he does, a grain of opium may be given. Sleep, by closing the pupil, is useful. The length of time during which a patient is to be kept in bed is a point upon which there has been a wide diversity of practice. Wenzel was in the habit at one time of confining his patients to their backs without change of position for a fortnight or three weeks, but afterwards he shortened the period of confinement to eight or ten days. Mr. Phipps, on the other hand, examined the eye on the morning after the operation, applied a shade, and allowed the patient to rise. A middle course appears the most judicious. The patient may be allowed in the course of the second day to be raised up in bed for a short time, to relieve the irksomeness of lying. The incision may be looked at on the third or fourth day. On the fifth or sixth day perhaps the patient may be allowed to be out of bed for a short time. On the seventh or eighth the eye may be fairly examined, but immediately after covered with the shade. In ten or twelve days the patient may be allowed to look at large objects. For the first fortnight he should make no use of the eye, nor even open it unless the surgeon be present. After a few days more he may be allowed to walk about the room. It is desirable that the patient's bowels should not be disturbed for the first twenty-four or even forty-eight hours after the operation, as the movements of the body in getting out of bed and while at stool may be injurious to the eye. After forty-eight hours a laxative clyster may be administered, if necessary. In healthy robust subjects an antiphlogistic plan of diet is to be observed for eight days or more, according to circumstances; after which soup may be allowed, and in about a fortnight after the operation a little solid animal food. To persons of advanced life, in whom it is important that the reparative powers should be well kept up, good beef-tea may be given from the first, in a day or two meat for dinner, and after five or six days a little porter.

"The aqueous humour generally continues to be discharged from the eye for about forty-eight hours; in some cases, however, for a shorter period, and often for a much longer, even for weeks. Lest the discharge of the tears, and also of the aqueous humour, if it flows from the eye, should be prevented, it is improper to cover up the eye too closely, and still more improper to load it with dressings and bandages. It is of the utmost importance, however, to keep the eyelids still, and prevent any attempt to use the eyes. These objects are completely obtained by the strips of

court-plaster, from the employment of which no bad consequences arise. Those which are applied immediately after the operation may be allowed to remain two or three days, but if the eyes are easy, for four or five days, after which time they should be removed, and the eyelids bathed with warm milk and water. Without opening the eyes, replace the plasters by new ones. This may be repeated every day until the wound is consolidated."

These observations by Mackenzie are replete with good sense. If they err at all it is on the right side. It is much better to keep the eyes at rest for a fortnight than to run the risk of setting up inflammation, which, when once established, lasts for several weeks, and may imperil the eyes; and it is to be remembered that he is speaking of the after-treatment of the flap operation as performed with Beer's knife, in which the section was much larger than that made at the present day; whilst the risk of prolapse, and the seriousness of that accident when it did occur, were much greater than in the mode of operating at the present day.

The treatment adopted by Soelberg Wells[1] is in the main that adopted by Von Gräfe, whose pupil he was, and I may therefore take it as representing Von Gräfe's proceedings, as well as those in very general use. The account is too long to be given *in extenso*, but I may quote some of the more important passages. In the first place, he says, as it is "of consequence to detect and combat any unfavourable symptoms at the earliest stage, the surgeon should visit the patient very frequently during the first few days after the operation, and, if possible, himself change the dressings, so that he may watch the condition of the lids, the quantity and character of the discharge, &c."

This every one who has had much experience in the after-treatment of cataract will cordially endorse. The cause of a considerable number of failures is undoubtedly a careless removal of the pad and bandage, when these are used. This is more particularly the case when the vitreous has escaped. Here the wound is often very tender, and gapes with the least movement, whilst the pad is unusually adherent. If, from want of patience in moistening the pad with warm water, the attempt is made to pull or drag it off, the lid is separated from the cornea, and the patient suddenly and forcibly exerts his orbicularis, opening the wound, and squeezing out much of the remaining vitreous. Wells proceeds to say that "the after-treatment must be varied according to the general health, constitution, and habits of the patient. The diet should, from the commencement, be light, nutritious, and easily digestible. Meat may be allowed once daily; it should, however, be finely minced, so that there is no need for mastication, which would disturb the

[1] A Treatise on the Diseases of the Eye.

quietude of the eye. Good beef-tea or mutton-broth may be given occasionally during the day, but slops are, as a rule, to be avoided. But whilst we endeavour to sustain the patient's strength, we must not fall into the opposite error of over-feeding him. In a very plethoric and full-blooded individual, especially if marked inflammatory and febrile symptoms manifest themselves, a strictly antiphlogistic regimen must be observed. With regard to stimulants and beer, we must be entirely guided by the patient's constitution and habits. It is very unwise to cut off all stimulants from an individual who has always, and perhaps largely, indulged in their use; we should allow him a moderate amount of his customary beverage, watching the while its effect, and diminishing or increasing the quantity as the case may demand. In feeble, decrepit persons, stimulants and malt liquor, together with a good nutritious diet, often prove of great service; quinine and ammonia being also given. It is well to administer a gentle purgative the day before the operation, so that the bowels may not require to be opened for a day or two after the latter. A mild dose of castor-oil should then be given, in order to prevent any straining; and this may be repeated if necessary. When the operation has been concluded, the patient is to be placed in bed in a darkened room. At night his hands should be tied to the side of the bed, to prevent his touching his eyes during sleep. The lids of both eyes may be fastened with a strip or two of sticking-plaster, although this is apt to irritate from its shrinking and hardening. I myself prefer a light bandage, especially Liebreich's, which is the most convenient for this purpose. If this is found to be too hot, I employ a very thin gauze bandage. A piece of soft linen is to be applied over the eyelid, to soak up any discharge, and prevent its clogging and hardening the charpie, a little pad of which is to be next applied, the whole being kept in place by the bandage. But if we desire to exert more pressure upon the eye, we must employ Von Gräfe's compress bandage, the application of which, however, demands far more care and practice.

"So much nicety and attention are required in the application of these bandages and in the regulation of the amount of pressure, that we are but seldom able to intrust this to a nurse. If we cannot change the compress ourselves, or leave this duty to a practised and trustworthy assistant, it is far better to abstain altogether from its use. It should be changed night and morning, and if the eye feels uncomfortable, even more frequently. The quantity and character of the discharge upon the linen and charpie should be examined, as it affords a clue to the condition of the eye. The edges of the lids should be softly sponged with lukewarm water, so as to remove any hardened discharge from the

eyelashes, which may also be smeared with a little cold cream or simple cerate. This will prevent their sticking together, and thus interfering with the ready escape of tears or discharge. Great care must, however, be taken not to rub or press upon the upper eyelid, otherwise the coaptation of the flap may be disturbed and union prevented. Much comfort and relief is afforded by the sponging and cleansing of the eyelids and the change of the compress. The eye should not, however, be opened or examined unless we specially desire to ascertain its condition. Union of the flap usually takes place within the first forty-eight hours, or even sooner. Then it is advisable to apply a drop of atropine once or twice daily to the inside of the lower lid, without widely opening the eye. This soothes the eye and dilates the pupil, so that there is less chance of a secondary cataract, as the torn edges of the capsule have no point to adhere against, and will therefore retract and shrivel up. Moreover, should iritis occur, it will be of great advantage to have the pupil already widely dilated. It is an interesting fact that if atropine was applied before the operation, its effect upon the pupil partially returns when the section is united and the aqueous humour reaccumulated. Should the atropine cause any irritation, a solution of belladonna should be substituted. A few hours after the operation, the patient generally experiences a slight sensation of pressure and smarting in the eye, which lasts for a few minutes but reappears at intervals of an hour or two. It is due to an accumulation of tears and aqueous humour. If the pain increases towards night and becomes continuous, and the eye is hot and the patient restless and uncomfortable, morphia should be administered either internally or endermically. I generally employ the subcutaneous injection, varying in strength from one-fifth to one-fourth of a grain. It may be repeated if necessary. If the eye is very hot and painful, much relief is often experienced from cold-water compresses. But their use requires much care and discretion, for if they are applied for too long a time, they may depress the circulation of the part too much, and thus increase the danger of suppuration of the cornea. I have also sometimes found great relief from the application of two or three leeches to the temple, especially in plethoric individuals.

"If the case goes on well without the appearance of any unfavourable symptoms, such as severe pain in and around the eye, swelling of the lids, muco-purulent discharge, or copious lachrymation, the eye should not be opened during the first five or six days. Nothing is so bad as being too curious as to the result, and opening the eye too early to assure ourselves that everything is going on well, for this may easily set up iritis.

"If after flap extraction the case has throughout progressed favourably, the patient may be permitted to leave his bed for an hour or two at the end of the fifth or sixth day. He should, however, wear a slight bandage, and the room be somewhat darkened, but it should at the same time be kept cool and well ventilated. If the remaining in bed prove very irksome, which is apt to be the case in country-people accustomed to an active life, it may be well to permit the patient to get up even on the third or fourth day. But then he must be very carefully watched. In a hospital in which there are no special eye-wards, the beds should have dark-blue curtains round its head, so as to afford a protection against cold and draughts and the bright light of the ward. In such a case, I think it also very advisable to keep the patient in bed some days longer than would be necessary in a private room or a special ward. At the end of the first week, the band may generally be exchanged for a shade, and the patient be gradually accustomed to the light. Should, however, any inflammatory symptoms appear, such as photophobia, lachrymation, swelling of the lids, &c., the bandage should be reapplied and increased care be taken of the eye. If the weather is favourable, the patient may go out into the air at the end of a fortnight. This often proves of great benefit, especially if there is any conjunctivitis which is apt to become chronic if the confinement to the house has been long. In such a case a weak astringent collyrium should be prescribed."

One of the most recent writers, Arlt,[1] states, in speaking of the after-treatment, that the object of the application of a roller is not to exert any pressure upon the eye, but to limit its movements, and especially to prevent the motion of the lids, though it also has a subsidiary influence in modulating the access of light. When Gräfe's pad and bandage came into general use, Arlt adopted it, but applied over it, in order to render it more secure, an elliptical piece of flannel, cut diagonally to the course of the fibres, two or three inches wide in the middle and about seven inches long, to each end of which an elastic cotton tape is attached, half an inch wide and thirty-six inches in length. One end of the piece of flannel is applied under the lobe of the ear, the other is brought obliquely over the face to the frontal eminence of the opposite side. After the tapes have crossed the occiput, it is carried over the forehead so as to exert some pressure against the maxillary protuberance from below upwards. The other tape is carried over the eyebrow and round the head to join with the first one. In this way the eye is not subjected to pressure, since it is only covered by a thin layer of charpie, linen bandage, and the flannel.

[1] Handbuch der Gesammten Augenheilkunde, Band iii. 1874, p. 278.

It has also the advantage of being easily and quickly removed. After the application of the bandage, the patient's comfort in bed should be studied. Usually two cushions are required, one reaching to the point of the shoulder, the other to the last cervical vertebra. A small horse-hair bolster may also be placed under the neck, which serves to facilitate the circulation and to prevent stiffness in the neck and dryness in the throat. If a higher position still be desired, a third cushion may be placed, reaching from the neck to the sacrum, but too many cushions rather tend to make the patient slip down in the bed, and to push with his feet, and so strain to regain his former position. During the first four or five days only fluid nourishment should be given, though it should be strong and sufficiently supporting. The drinks and alcoholic fluids usually taken need not be withdrawn. The patient should remain for the same length of time in bed, or, if there have been escape of vitreous at the time of the operation, two or three days longer. Many persons become much irritated by the bandage, and under these circumstances one may be left open, or even in some cases both. After five or six hours, *i.e.*, at the time of the first visit, the patient may be allowed to lie flat on his back, the movement being effected gently and without hastening the respiration. If a sense of oppression is felt at the chest, it will be advisable that he should keep in the sitting position for some hours longer. The hands may be kept down by a bandage, but this usually produces more or less irritation, which cannot be prevented. Arlt prefers the morning for the operation, for many reasons. A few hours after the operation the patient should micturate, and the use of a catheter is occasionally required. The object of the first visit of the surgeon is the inspection of the bandage. The pain of the wound lasts for one or two hours, and transient stabbing pains are felt for four or five hours. These usually disappear after a discharge of tears, though they sometimes recur for some time. In such cases it is unnecessary to remove the bandage. If the pain and discomfort increase, the eye must be examined; the lids should be gently opened by drawing down the lower lid, and the quantity of fluid which escapes should be noted. In many instances this proceeding alone affords the required relief; fresh charpie may then be applied and a lighter roller placed over the eye, or a wet compress may be used. The discomfort may have arisen from the rolling inwards of the lower lid, in which case a little roll of charpie may be placed upon the skin, between the lower margin of the orbit and the inferior border of the tarsal curled up, or if there be marked tendency to entropine, collodion may be applied or traction exerted by means of a strip of plaster.

An American writer, the reference to whose paper I am unable

to find, some years ago suggested the fixation of the flap by means of a suture, and recorded several cases where this plan had proved successful. It might be adopted in cases where the cornea was very flabby, and a large section had been intentionally or unintentionally made, or where there was considerable loss of vitreous, and there seemed some probability that the edges of the wound would not come into or keep in apposition, otherwise the risk is too great. The cornea is a very tough structure, and it is exceedingly difficult to pass a needle through it, without holding, and therefore pinching, it with forceps; and thus, in such a cornea as we are here supposing to exist, would be almost certain to induce sloughing. Moreover, it is very difficult to drag a wire through the cornea, as I have found in my frequent attempts to effect transplantation of the cornea; and even if one edge of the wound be transfixed, great dragging and violence must be used in penetrating the opposite edge.

Professor Zehender of Rostock gives the following directions:[1]—"As soon as the operation is completed, a well-adapted bandage should be applied to both eyes. The patient should then be placed in a moderately dark chamber; his clothes should be removed by an attendant with as little effort as possible, and he should be placed in bed, with the directions to lie on his back as quietly as possible for a few days. In order to restrain any voluntary or involuntary movements of his hands towards the eye, it is advisable to attach them by a band to the foot of the bed, with such freedom of movement only as will allow him to raise them as high as the chest. The further treatment, if no untoward accident occur, is precisely similar to that of an ordinary wound. Some recommend the immediate application of cold compresses to the eye; others prefer to wait till their use is indicated by the subjective sensations of pain and heat. If such symptoms begin to be very manifest or persist unduly, it will be expedient to apply a leech or two to the temple or behind the ear; formerly, indeed, it was customary to meet these symptoms with free and repeated venesection, but this practice is now rarely adopted. The food supplied to the patient during the first few days should be of a thin or fluid consistence, though it is quite unnecessary to forbid the use of all nourishing broths and of wine; the food, however, should not be administered too hot. Moreover, there is no necessity, especially in the case of old people, for making any material alteration in their ordinary mode of living. It is advisable, or at least cannot be regarded as unwholesome or unnatural, looking at the quiescent recumbent position of the patient, that no action of the bowels should take place in the course of the first day after

[1] Lehrbuch der Augenheilkunde, 1879.

the operation. But if it be remembered that the first evacuation after several days' constipation is, as a rule, accompanied with much muscular effort, and that this retards the circulation of blood through the lungs, and consequently also in the blood-vessels of the head and of the eyes, it appears advantageous to administer some medicine which may obtain a soft evacuation every day, and for this purpose castor-oil is most appropriate."

In regard to Zehender's observations, I quite agree with his remark that the diet of old people should not be materially altered. Before a cataract operation is performed there is with most people a considerable amount of mental excitement. A bracing up of the resolution, especially if the use of an anæsthetic is dispensed with occurs, and a corresponding depression, often requiring the use of rather a generous diet and wine, follows. The languor and depression of some patients is very remarkable, and has seemed to me to call for the rather free administration of stimulants.

The amount ofalcohol to be given after a cataract operation must, however, vary with the individual; whilst some knowledge of the habits of the patient should, if possible, be obtained by the operator. I knew a gentleman who was accustomed to take so large an amount of alcohol at night, that he was never known to go to bed sober. He came to town, and was as usual, deprived of his customary supply. Delirium tremens set in a few days after the operation, and death occurred in the course of a week, which would probably have been avoided if some moderate quantity of his ordinary stimulus had been allowed, to sustain him after the shock of the operation. For the same reason, I rarely order morphia or any preparation of opium to be taken, believing that it often produces nausea and want of appetite.

The plan of tying the hands, or restraining their movements by a bandage applied to the wrists and looped round the end of the bed, recommended by Wells, Zehender, and others, I have often practised, and have now discarded, believing that it does more harm than good, by awakening the patient and disturbing the sleep of the first night, which is a very important period in the union of the wound. For the same reason I think it unadvisable that a nurse or relative should sit up with the patient, unless under special circumstances. Their movements—poking the fire, making a meal —awaken the patient, and are very likely to make him feel and magnify slight pains, which would have passed unnoticed in sleep.

The last writer I shall mention is Klein.

Klein,[1] after ridiculing the frequent venesections performed a few years ago, observes that iced compresses were next introduced, and that their use was carried beyond all reasonable limit. Apart from such extreme procedures as these, there can be no

[1] Lehrbuch der Augenheilkunde. Wien, 1879.

doubt that, for a week after extraction, the patient should be kept on his back in a state of perfect quiescence; a compress bandage should be applied to both eyes, and should be changed only once in every forty-eight hours; whilst it should be continued to be applied long after the first week. The amount of food given should be almost reduced to that allowed when a patient is said to be on low diet. Inflammation should be promptly met by the usual means. The room should be darkened, and gradually opened out as the patient becomes convalescent. The eye operated on should not be used till several weeks have elapsed.

Having thus passed in review the methods of procedure of some of the principal operators in this and other countries, I may perhaps be allowed to state my own. In private practice I invariably operate at, or soon after, 9 A.M., a time that, I think, presents several advantages. Through a large part of the year the light is good. The patient has had more or less sleep, and is fresher than at any other time of the day; has no clothes to take off, but need only have a blanket spread on a firm couch and a dressing-gown placed over his shoulders. If an anæsthetic be taken, the early morning is by far the best time for its administration, since the stomach is empty and the absolute quantity of blood in the vessels less, so that a much smaller quantity of the vapour need be inhaled; which has the double advantage that the system is not so much depressed and sickness is less likely to occur. Immediately after the completion of the operation a piece of fine dry cambric is placed over each eye, and a light calico bandage, about two inches in width and one and a half yards long, is passed twice round the head and brought over the vertex, its position being secured by pins or a few stitches. The patient sometimes remains asleep for an hour or two, but sometimes awakes almost immediately, and in either case is not removed from the sofa. A little food is directed to be given about midday, and this should consist of cold milk, which, if there is any tendency to vomiting, should be iced. If milk is objected to, beef-tea or a cup of tea or coffee and soft bread may be given. In the course of two or three hours, if there be no sickness, he may be put to bed and will probably sleep. Some smarting pain is usually experienced, but this gradually subsides; and I am in general averse to prescribing any preparation of opium.

The bandage and cotton-wool pad are not always patiently endured. Some time ago I operated, without chloroform, on a healthy old gentleman of eighty years of age. He bore the operation well, remained on the sofa throughout the day, and in the evening went to bed in the adjoining room. I saw him about nine o'clock in the evening and dressed the eye. About three o'clock in the morning I received a message to come to him at once, as he was delirious. On entering the room, I found the patient in a highly

excited state, fighting vigorously with three men who were endeavouring to hold him down, and talking incoherently, with flushed face and quick pulse. He had had no sleep, and had begun to get excited shortly after I left. His face was congested, his pulse full and rapid, his body bathed with perspiration; and the moment his hands were free he made attempts to tear off the bandage. I gave up his eye as a lost one, and after debating for a few moments as to what it were best to do, I determined to remove the bandage. I accordingly begged those who were in the room to leave his arms free and to go out of the room. I spoke kindly to him, told him he was going on all right, and that I should now let him have one eye open. He at once became quiet, allowed me to take off the bandage; and on opening the eye not operated on, stared about him, saw where he was, took a little food, laid his head on the pillow, and, utterly exhausted, fell asleep before I left the room. Carefully dieting him and giving him permission to use the opposite eye freely prevented his having any return of his unpleasant symptoms, and he made an excellent recovery.

I almost invariably see the patient again in the evening, and with the greatest delicacy and care remove the dressing. The forehead, nose, cheeks, and lower eyelids are gently sponged with warm water, which affords the patient the greatest possible relief and comfort. It takes away the feeling of stickiness and stiffness, prevents undue heat, and affords the surgeon the opportunity of encouraging the patient by saying that all is doing well. The lower lid may be drawn down so as to separate it from the upper, but no attempt should be made to open the eye or inspect the wound; for if all is going on well, to open the eye would be running a needless risk, whilst any important accident, such as doubling back of the corneal flap (which, however, I have never known to occur with the linear incision) or choroidal hæmorrhage, would betray itself at an earlier period and render interference requisite. I usually see the patient and wash and dress the eye night and morning for three days, after which I only see him once a day for three days. At the expiration of a week he is allowed to dispense with the pad and to wear only the bandage, or even, if there be no inflammation, to wear a shade. The American shades lately introduced, composed of perforated brown canvas bound with an edging of brass and with two spring clips, answer well and are comfortable to wear. As a rule, quinine and iron or strychnia and iron is given twice a day for a few days, and the patient is directed to walk in the open air if the weather be tolerably fine. Glasses may be ordered for the patient after the lapse of a fortnight; and, with attention to conditions of astigmatism, vision may often be brought up to far greater perfection than was formerly possible with spherical glasses alone.

ON THE

# EXPLANATION OF STANNIUS'S EXPERIMENT

AND ON

# THE ACTION OF STRYCHNIA ON THE HEART.

BY

T. LAUDER BRUNTON, M.D., F.R.S.,

AND

THEODORE CASH, M.D.

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The remarkable experiment to which Stannius has given his name consists in applying a ligature around the venous sinus of the frog's heart, just at the point where it joins the auricles. The consequence of this is, that the auricles and ventricles at once cease to beat, and remain in a state of quiescence, lasting for a time varying from a few minutes to half an hour or more, while the venous sinus still continues to pulsate uninterruptedly. A similar result is produced when, instead of applying a ligature round the sinus, the sinus itself is separated from the auricles by an incision. If, however, instead of suddenly removing the whole of the venous sinus from the remainder of the heart, it is gradually removed, the instant stoppage of the auricle and ventricle does not take place. If the ventricle be now separated from the auricle, while the two are remaining in a state of complete quiescence, the ventricle again commences to pulsate, while the auricle remains perfectly still. Two explanations of these phenomena have been given. The one is that the section or ligature of the heart at the junction of the venous sinus and the auricles excites the inhibitory apparatus in the auricles to such an extent as to prevent both them and the ventricle from moving. This explanation, however, seems to be disproved by the fact that the same result is obtained after the heart has been previously poisoned by atropia, which completely paralyses its inhibitory apparatus, and

it would therefore appear that the still-stand of the heart in this experiment cannot be due to excitement of the inhibitory apparatus. The second explanation is, that the motor ganglia of the heart are unequally distributed in the ventricle and auricle, the greater number being in the venous sinus and ventricle, and the fewest in the auricle.

When the sinus, then, is separated from the remainder of the heart, the motor power in the auricles and ventricle is insufficient to make them pulsate, although the ventricular ganglia are sufficient, when separated from the auricle, to set the ventricle in motion. This explanation is opposed to the fact that if the venous sinus be gradually, instead of suddenly, separated from the auricle, they will still continue to pulsate. Notwithstanding this objection, however, it seems to us that this explanation, although very probably it does not represent the whole truth, is to a considerable extent true, and the cessation of the auricular and ventricular movements, after the removal of the venous sinus, is really due, in a great measure at least, to want of motor power. It occurred to us that if this were so, we ought to be able, by stimulation of the motor ganglia, to reinduce the cardiac pulsations after they had ceased from ligature of the venous sinus. It is well known that if a single galvanic shock be applied to the ventricle when in this state of diastolic quiescence, the ventricle will contract once at each application of the stimulus, but the single pulsation is not succeeded by a succession of rhythmical beats. As warmth has a very powerful effect in increasing the cardiac activity, it seemed probable that the application of warmth to the heart, when in the condition of still-stand thus described, might so far stimulate its motor ganglia as to allow it to resume its rhythmical pulsations. We therefore induced complete still-stand in the frog's heart by applying the ligature in the usual way. On then warming the heart, either by directing upon it a current of air heated by passing it through a hot glass tube, or by bringing into its neighbourhood a heated copper wire, we found that the rhythmical pulsations again commenced, and continued for two or three minutes after the time that warmth was applied.

The cessation of the movements of the heart, after the removal of the venous sinus, seemed to us analogous to the cessation of respiratory movement and of vaso-motor tone after the influence of the medulla oblongata has been removed by division of the spinal cord at the occiput. It has been found by Prokop Rokitansky that the movements do not cease completely, after division of the cord, when the animal has been previously poisoned by strychnia, and that both vaso-motor reflex and respiratory movements can be reinduced in such animals by strychnia adminis-

tered after the cord has been divided. It occurred to us that possibly a similar phenomenon might be observed in the heart. We, therefore, administered strychnia to a frog, and as soon as the spasm occurred, the animal was killed and a ligature placed around the heart. No cessation of movement, however, was observed. When a frog was first killed however, and still-stand of the heart was induced by application of a ligature, a solution of strychnia placed on the outside of the heart did not reinduce rhythmical pulsations, but when the solution was injected by a fine pipette into the interior of the ventricle, rhythmical pulsations again commenced. This rhythm, however, was independent of that which the venous sinus still continued to pursue. After maintaining this for some minutes, it again stopped, and the auricle was seen to contract after the ventricle. The aorta was now cut, and the ventricle again contracted, but the auricles remained quiescent. On stimulating the ventricle, it now went on beating regularly.

From these experiments it would appear that the still-stand induced by ligature of the venous sinus has a deficiency of motor power in the auricle and ventricle, and that when we increase the excitability of the ganglia in these parts by warmth or by strychnia, the pulsations recommence. The following seems to us the best explanation of the phenomena observed. The motor ganglia of the heart, we think, are in all probability called into action by reflex stimulation. This reflex stimulation may originate in impressions conveyed to them by afferent nerves from the internal or external surface of the heart, or by impressions conveyed to them by the afferent nerves from the other cavities of the heart. We think, also, that although they respond to the stimuli conveyed reflexly from the internal or external surfaces of that part of the heart in which they are contained—as shown, for example, in contraction of the ventricle on stimulation by a needle or an electrical current—they are nevertheless most readily thrown into rhythmical action by the impressions conveyed to them from the other cavities. In a normal condition of the heart, the venous sinus is the first cavity to contract; next comes the auricle, and next the ventricle; and a stimulus of contraction probably proceeds from one to the other along a channel furnished by the nervous filaments which connect them. When the channel is suddenly interrupted, as by ligature or division of the venous sinus, the motor stimuli proceeding from the venous sinus to the auricle and ventricle can no longer pass to them, and the reflex impulses proceding to their ganglia from the external and internal surfaces of these cavities are insufficient to call them into action. The auricles and ventricles, therefore, remain in a state of

quiescence for a longer or shorter period; this quiescence, however, is not completely permanent. After a while the ganglia seem to become adapted to the new conditions. Their sensibility, too, increases, and the stimuli proceeding to them from the surface of the heart are sufficient to call them into action. When the venous sinus is gradually removed from the auricles and ventricle, instead of being suddenly detached, time is afforded for this adaptation to take place before the removal has been completely effected, and thus the rhythm is not disturbed, as it is when the division is suddenly made or the ligature suddenly applied. In these respects the cardiac nervous system is analogous to the vaso-motor and respiratory systems. The ordinary channels through which the vaso-motor and respiratory centres and spinal cord are called into action are the fibres which proceed to them from the medulla oblongata. If these channels are suddenly interrupted by section of the spinal cord at the occiput, those parts of the vaso-motor and respiratory centres contained in the spinal cord cease to act. The same is the case when a large portion, but not the whole, of the respiratory centre in the medulla is destroyed, as by division of one-half of the medulla. When a large portion of this respiratory centre is thus destroyed, the animal at once ceases to breathe, and remains in this condition for many hours. If left to itself, death would of course take place; but if artificial respiration be maintained for a long time, by and by faint respiratory movements occur, which very soon cease if the animal be left to itself. But Schiff has found that if artificial respiration be still kept up, these movements become stronger and stronger, until at length spontaneous respiration is sufficiently re-established to save life.

In Rokitansky's experiment, the ordinary channels for the passage of stimuli from the medulla oblongata to the respiratory and vaso-motor centres in the cord were at once destroyed; but the application of strychnia before or after the section had so greatly increased the activity of the centres in the spinal cord that they were able to take up their functions at once, instead of after a lapse of time, as in Schiff's experiment. It seems to us, then, that the function performed by the venous sinus in regard to the rhythmical movements of the frog's heart is to a certain extent analogous to the functions of the medulla oblongata in regard to respiration and vascular tension, and that the action of heat and of strychnia upon the systems is very similar indeed. The very marked action as a cardiac stimulant which strychnia is shown by the experiment to possess, is one the practical importance of which it is hardly necessary to point out. We would merely remark, that in cases of general debility and lack of tone, especially when

occurring in consequence of overwork, there is, perhaps, no tonic in the pharmacopœia to be compared to strychnia; and widely known though its utility may be, it is not nearly so commonly employed as it deserves, especially at this season of the year, when both medical men and their patients are suffering from the consequences of prolonged overwork and mental strain. Small doses of strychnia or nux vomica restore both mental and physical power, and give a sense of well-being in a manner in which, so far as our experience goes, nothing else will.

ON

# THE CAUSE OF THE NON-PRECIPITATION OF OXIDE OF COPPER

## IN TESTING CERTAIN CASES OF DIABETIC URINE.

BY

T. LAUDER BRUNTON, M.D., F.R.S.

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In testing for sugar in urine, I have frequently observed that on boiling, after the addition of sulphate of copper and caustic potash, or of Pavy's solution, the blue colour of the mixture disappeared, and was replaced by a brownish-yellow one, somewhat darker than that of the urine itself, but without any precipitate whatever being thrown down. When this has been the case, I have generally tested the urine by Moore's test with liquor potassæ alone, in order to ascertain whether sugar were present or not. As a rule, I have attributed little importance to this decolouration without precipitation of oxide of copper, and have considered it to be usually caused by the presence of excess of uric acid. or to some reducing or organic compound of unknown nature. A few months ago, however, on examining the urine of a patient whom I knew to be diabetic, I found to my astonishment that I got no precipitate of oxide of copper, although I got the blue colour of the mixture of urine and cupric solution destroyed, and its place taken by a tolerably bright yellow opalescence. Knowing as I did that sugar was generally present in specimens of this urine, it occurred to me that there might be some other substance present in the urine which kept the reduced oxide of copper in solution. It seemed not improbable that if I were to dilute the urine, I should so lessen the solvent power of this substance, whatever it might be, as to allow of the oxide being precipitated. I therefore took about the third of a test-tube full of water, and

added to it a little of Pavy's solution, poured into it about half a drachm of the urine, and boiled it; and this time got an abundant precipitate of yellow cupric oxide, clearly showing that my supposition was right, and that the urine contained abundance of sugar, accompanied by some substance which had the power to retain cupric oxide in solution. My patient had been suffering from albuminuria as well as glycosuria, but the albumen had completely disappeared, and the sugar had become greatly diminished under a skim-milk diet. I tested the urine with cold nitric acid, in order to see whether the albumen was still absent, and found that it was so; but I got a purple colouration with the acid, such as is usually attributed to indican. It seemed possible, then, that the substance in the urine which kept the cupric oxide in solution was either indican or some substance accompanying it. I have therefore tested a great number of specimens of urine in the out-patient department of St. Bartholomew's Hospital, and I find, when I get a well-marked purple reaction on the addition of cold nitric acid, that the urine will, to a great extent, prevent the precipitation of oxide of copper. The method I have adopted for demonstrating this fact is the following:—I add to about two drachms of the urine half a drachm of syrup of grape-sugar, containing 10 per cent., and then test for sugar in the ordinary way, either with Pavy's solution or with sulphate of copper and caustic potash. I then find that on boiling I get the colour destroyed and replaced by a yellow, but that no precipitate occurs. Not unfrequently I obtained a dark yellow opalescence, which, by its contrast with the blue solution, might at first be mistaken for an actual precipitate; but, on looking through it, it is found that no precipitate exists, and that the fluid is quite transparent though opalescent, almost like a solution of glycogen. Its transparency is perhaps more readily demonstrated by allowing the light to shine through it upon a piece of white paper held behind it. It is then found that the yellow part of the solution allows the light to pass as readily as the blue, and concentrates it as a bright yellow band upon the paper behind. If a comparative experiment be made with a similar mixture of ordinary urine not giving the purple reaction with nitric acid and grape-sugar, or of water and grape-sugar, the difference will be at once perceived, because the part of the tube in which the oxide has been thrown down is quite opaque, so that one cannot see through it; and when the light is allowed to fall upon it, it throws a dark shadow upon the paper behind, while the part of the solution in which no precipitation has taken place allows the light to pass freely. The curious opalescence resembling that of glycogen is suggestive, but I have made no observations at present in this direction. I cannot at present say that indican is the substance which keeps the oxide of

copper in solution; indeed, Iam strongly inclined to believe it is some substance which may be, and often is, accompanied by indican, but not indican itself. All I can yet do is to mention the non-precipitation of oxide of copper in urines which give a purple reaction with nitric acid, and to draw the attention of the profession to this fallacy in testing for sugar in urine, and to say that one mode of avoiding it is to use more tests than the potash alone; because I found that the presence of this body, whatever it may be, does not prevent the brown colour occurring on boiling urines containing sugar with caustic potash. The other is, in cases of suspected urine to use only a small quantity, well diluted, along with Pavy's solution, instead of using a mixture of the solution with pure urine.

Urines which give a purple reaction with nitric acid do not all possess an equal power of retaining oxide of copper in solution, although, so far as my experience goes, they all have this to a greater extent than ordinary urine. Not unfrequently, after a mixture of Pavy's solution with urine giving this reaction has been boiled and allowed to stand for a few minutes, it becomes of a dark-brown colour, and a precipitate may then occur.

According to Kühne,[1] the amount of sugar present in normal urine varies considerably, but one difference can always be observed between the normal which is the richest, and the diabetic urine which is the poorest in sugar. This difference does not consist in the amount of the reduced cuprous oxide, but in the precipitation of this substance. In normal urine the cuprous oxide may be reduced but it is not precipitated, and this, says Kühne, is what must always be carefully noted in the examination of urine for diabetes. Normal urine must, therefore, in addition to sugar, contain substances which, when mixed with free alkali, are able to retain the cuprous oxide in solution. Cuprous oxide, when once precipitated, is not readily soluble, but certain substances will retain it in solution in considerable quantity if they are present while it is being formed. Ammonia, however, can hardly be the agent by which cuprous oxide is retained in solution in ordinary urine, for although it is produced by heating caustic alkalies with urea, it escapes almost immediately; and as it is found in diabetic urines as well as in normal, it cannot be the substance which retains the cuprous oxide in solution in normal urine. Moreover, normal urine, when treated with soda and cupric sulphate, does not deposit any cuprous oxide or metallic copper when treated with dilute sulphuric acid, as an ammoniacal solution of cuprous oxide would do. Consequently substances must be present in normal urine which are absent in most cases of diabetes, and these substances must be excreted by

[1] Kühne's Physiologische Chemie, p. 519.

healthy persons in large quantities, for normal urine will often dissolve ten times as much cuprous oxide as it can itself form by reduction. It is only necessary to add to normal urine measured quantities of diabetic urine, or weighed quantities of sugar, in order to convince one's self that even when the amount of sugar is increased by one-half per cent., and sometimes even by 1 per cent., Trommer's test gives a negative result, if one judges by the precipitation of the cuprous oxide. This has hitherto always been the case, and the numerous researches which have been made on the excretion of sugar by the kidneys, after feeding with sugar or its injection into the blood, are therefore to some extent valueless, especially as the experiments have generally been made with dogs, the urine of which animals contains enormous quantities of the substances which dissolve cuprous oxide. Of one of these substances we can speak more definitely. It is, according to Winogradoff, creatinine, an alkaline solution of which retains in solution the cuprous oxide which has been reduced by means of sugar in such a way that it is not precipitated by dilute sulphuric acid. Creatinine, however, is in all probability not the only substance concerned in preventing the precipitation of cuprous oxide in normal urine. In diabetes these substances which precipitate are generally absent, and Winogradoff found, in fact, that the excretion of creatinine in many cases of diabetes was diminished or completely arrested. But this is not always the case, for there are some kinds of diabetic urine which allow only a part of the cuprous oxide to be precipitated, and retain another part in solution. Indeed, there are some where the precipitation of cuprous oxide is absent even when the urine contains 1 to 1½ per cent. of sugar. We can readily see that in such cases, when the amount of sugar sinks under 1 per cent., Trommer's test would apparently indicate the entire absence of sugar. "After many years' observation," says Kühne, "I am inclined to suspect that those substances which retain cuprous oxide in solution are found in those cases of diabetes which run a slow course, and in which, with the exception of the high percentage amount of sugar in the urine, the symptoms of diabetes are absent or only slightly marked, and the urine retains its normal depth of colour."

In the most typical cases, on the other hand, with excessive secretion of a very pale urine, with a dry skin, and frequently with the formation of cataract, these substances are either entirely absent from the urine or present in very small quantities. Such cases must, therefore, in addition to the increased formation of sugar, be complicated with another pathological process, which consists in the non-formation or non-excretion of these substances. It would be desirable to investigate how far this last process is

secondary, and produced through the long imbibition of the tissues with sugar.

The case which I have just narrated serves, I think, to show that the non-appearance of these substances in urine is not due to the long-continued action of sugar on the tissues, as Kühne thinks it might possibly be, but is rather owing to a close connection between their formation and the production of sugar itself in the normal manner in the body; for in this case, while the sugar was present in large quantities, the urine presented the ordinary appearance of diabetic urine, but as the amount of sugar excreted in the urine diminished, these substances again made their appearance.

# NOTES

OF

# POST-MORTEM EXAMINATIONS OF CASES OF HÆMORRHAGE WITHIN THE CRANIUM.

BY

NORMAN MOORE, M.D.

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The following are notes of all the cases of cerebral hæmorrhage examined by me in the post-mortem room of St. Bartholomew's Hospital from January 1879 to October 1880.

The two first cases deserve notice as examples of hæmatoma of the dura mater, found in patients greatly emaciated by chronic disease.

Fourteen cases of hæmorrhage into the cerebral substance are given. The probable primary hæmorrhage in these was—

| | |
|---|---|
| Corpus striatum (right) | 2 |
| „ „ (left | 1 |
| Optic thalamus (right) | 4 |
| „ „ (left) | 3 |
| Cerebral hemisphere (right) | 1 |
| „ „ (left) | 1 |
| Pons Varolii | 2 |

In each case the cerebral lesion is first described, and then any other morbid changes found in the body.

Caroline C., aged 49 years (P.M. Record vii. 183).

On removing the skull cap, the right side of the dura mater was seen to be very loose and bag-like. On opening it, a sac containing a little shred-like blood, and with a distinct limiting membrane, was found.

The arachnoid and the brain substance were everywhere normal.

There was great emaciation, due to cancer of the pylorus.

Alfred H., aged 18 years (P.M. Record viii. 230).

There was a hæmatoma as large as a shilling, and with a distinct limiting membrane on the dura mater over the posterior part of the left cerebral hemisphere. The brain was shrunken. The body was greatly emaciated. The case was one of diabetes.

No symptom pointing to the hæmatoma was observed in either case.

Joseph B., aged 44 years (P.M. Record vii. 76). Died in a seizure before reaching a ward.

*Brain:* Hæmorrhage into the right corpus striatum, completely destroying it, and filling the right lateral ventricle with blood. A tract of softened tissue extended from the corpus striatum downwards as far as the grey matter of the base. Numerous minute branches of the right middle cerebral artery lay in the softened tissue, with clots proceeding from the open ends.

There was a minute hæmorrhage in the pons Varolii.

Arteries of the circle of Willis all highly atheromatous.

*Heart:* Enormously hypertrophied; weight, 30 oz.; valves and pericardium normal.

*Aorta:* Very slightly atheromatous.

*Kidneys:* In an advanced stage of chronic interstitial nephritis.

William S., aged 47 years (P.M. Record vii. 234). Died two days after seizure.

*Brain:* In the outer part of the right corpus striatum was a cavity half an inch long, and from one-eighth to one-twelfth of an inch in width. The cavity contained a small quantity of blood and no clot. There was a narrow zone of softened tissue around its walls, but the ventricular floor was not destroyed. The rest of the brain was quite normal.

Arteries of the circle of Willis highly atheromatous.

*Heart:* Hypertrophied; weight, 23 oz.; valves and pericardium normal.

*Aorta:* Highly athermatous, with several large calcified patches.

*Kidneys:* In an extreme state of cystic disease (described by Mr. F. S. Eve, Path. Trans. vol. xxxi.)

Elizabeth S., aged 65 years (P.M. Record viii. 176). Died day after seizure.

*Brain:* Left corpus striatum ploughed up by a large clot, which filled the lateral ventricle. About one-twelfth of an inch of the

innermost part of the corpus striatum was all that remained, and this was yellow and completely softened. Rest of brain normal.

Arteries of circle of Willis atheromatous, but not extensively so.

*Heart:* Slightly hypertrophied; extreme stenosis of mitral valve; other valves and pericardium normal.

*Aorta:* Highly atheromatous.

*Kidneys:* Normal.

Charles S., aged 42 years (P.M. Record vii. 181). Died three days after seizure.

*Brain:* Right lateral ventricle filled by a clot. The blood had entered the ventricle from the outer and posterior part of the roof. The hæmorrhage, widening in its outward track, extended from a point nearly in the centre of the optic thalamus. The inferior substance of the corpus striatum was excavated, and the hæmorrhage extended outwards to the anterior part of the posterior cerebral lobe, and into, but not through, the cortical substance. There was softened brain tissue all round the clot but no further softening towards the middle line from the point of hæmorrhage in the centre of the optic thalamus.

The basilar artery was slightly atheromatous. The other arteries of the base were healthy.

*Heart:* Hypertrophied; weight, 19 oz.; valves and pericardium normal.

*Aorta:* Very slightly atheromatous.

*Kidneys:* In a condition of chronic congestion only.

Thomas G., aged 56 years (P.M. Record vii. 306). Died day after seizure.

*Brain:* In the posterior third of the corpus callosum was a rent occupied by a clot, and each lateral ventricle contained one.

The hæmorrhage had begun in the outer and posterior part of the optic thalamus, in which there was a rent, and had extended upwards into the posterior part of the cerebral hemisphere and into the corpus callosum. In the right corpus striatum, within the inner capsule, was a small and evidently old cavity containing a shrunken clot.

Arteries of the circle of Willis highly atheromatous.

*Heart:* Slightly hypertrophied; valves and pericardium normal.

*Aorta:* Very slightly atheromatous.

*Kidneys:* In an advanced stage of chronic interstitial nephritis.

There was a partially healed gastric ulcer at the cardiac end of the stomach, which was adherent to the diaphragm. (Described by me, Path. Soc. Trans., vol. xxxi.)

Frank B., aged 45 years (P.M. Record vii. 373). Died eighteen days after seizure.

*Brain:* Surfaces normal; corpus callosum not arched; no blood in the ventricles.

On the right side was a hæmorrhage into the outer and anterior part of the optic thalamus and the posterior and outer part of the corpus striatum. A clot filled the rent, which measured one-third of an inch from above downwards, and one-eighth of an inch from within outwards, and half an inch from before backwards. The outer edge of the clot was one-eighth of an inch from the surface of the ventricle, and the rent was surrounded by a narrow zone of yellow, softened tissue.

On the left side, just without the edge of the inner capsule, was a small gritty mass in the corpus striatum surrounded by a partially decolourised clot.

The rest of the brain was normal. Vessels of the base atheromatous.

*Heart:* Adherent to pericardium by several layers of soft blood-stained lymph. Left ventricle hypertrophied; weight of heart, 21 oz.; valves normal.

*Aorta:* But slightly atheromatous.

*Kidneys:* Showing advanced chronic interstitial nephritis.

John S., aged 63 years (P.M. Record viii. 23). Death in third week after seizure.

*Brain:* On the right side convolutions much flattened; the island of Reil bulged outwards so much as to look like a tumour projecting into the fissure of Sylvius.

The right lateral ventricle contained a clot, which extended forwards to within one inch of the anterior extremity of the brain. It began at the outer part of the right optic thalamus, and had ploughed up the outer part of the corpus striatum and the whole roof of the lateral ventricle over both corpus striatum and optic thalamus.

The rest of the brain was normal, and the left lateral ventricle contained no clot.

Arteries of the circle of Willis highly atheromatous.

*Heart:* Weight, 13 oz.; valves and pericardium normal.

*Kidneys:* Engorged, but without signs of actual disease.

*Lungs:* A small old cavity at the apex of the left lung. Some recent pneumonia of the right.

*Intestines:* The vermiform appendix was ulcerated and perforated one inch from its end, and communicated with an encapsuled collection of pus as large as a hazel-nut.

The House Physician, Mr. H. B. Boulter, has been so good as to

give me notes of the case, a summary of which I have Dr. Gee's permission to insert here.

The patient was a cashier in a book warehouse, and felt giddy while at work on January 10th. On January 12th, between 10 and 11 A.M., he suddenly felt giddy, fell upon his left side, and became unconscious. The loss of consciousness lasted a few minutes only. After it he felt sleepy and sick, but did not vomit. He tried to rise from the ground but could not, and was carried to the Hospital. On admission he was found to be dull and heavy, but able to talk and to answer questions. He could not open his left eye; both eyes were turned to the right, both pupils small and inactive. His tongue, when protruded, turned to the left; his mouth was drawn to the right side, its left angle was drooping. His right brow was elevated, and the right half of his forehead became, on his frowning, more wrinkled than the left. There was complete paralysis of the left arm and leg. His urine was neither albuminous nor saccharine.

The next day he could open his left eye.

Jan. 14.—He slept much during the day, and rambled and was restless all night.

The next day his tongue was protruded straight. He ate well, and seemed more sensible.

Jan. 16.—He was more drowsy. There was rigidity of his left arm.

Jan. 18.—He had not slept well, and had rambled at night, and had lost the control of sphincters. He took his meals well. The rigidity of his arm continued.

Jan. 19.—The rigidity of the arm was greater. The leg was not rigid. Sensation was almost absent in his left arm, but seemed normal on the left side of his chest and face.

The next day he was distinctly less intelligent.

Jan. 22.—His face appeared more drawn to the right side than before.

Jan. 23.—His right arm became restless and was continually moved about. He could no longer be roused to answer questions; his pupils were dilated, and his breathing stertorous. The contraction and rigidity of the left arm seemed greater.

He continued in this unconscious state till the 29th, when he died.

The chart of his temperature is interesting as showing that it rose as the injury to the brain extended.

From the post-mortem appearance of the brain and the condition of the clot, it is probable that the hæmorrhage began on January 10th, extended on the 12th, and continued, with brief pauses, till death.

TEMPERATURE.

| | Hour. | Morning. | Evening. |
|---|---|---|---|
| Jan. 12. | ... | ... | 97 |
| „ 13. | ... | 98 | 99.4 |
| „ 14. | ... | 99 | 99.5 |
| „ 15. | ... | 98.6 | 98.2 |
| „ 16. | ... | 98.5 | 97.6 |
| „ 17. | ... | 97.5 | 97.5 |
| „ 18. | ... | 98.2 | 98 |
| „ 19. | ... | 97.4 | 98 |
| „ 20. | ... | 96.4 | 96.4 |
| „ 22. | ... | 98.6 | 97.5 |
| „ 23. | 1.30 | ... | 99.1 |
| „ „ | 6 | ... | 97 |
| „ „ | 9 | ... | 96.4 |
| „ „ | 11.45 | ... | 96.6 |
| „ 24. | 3 | 98.5 | ... |
| „ „ | 6 | 99 | ... |
| „ „ | 9 | 98.4 | ... |
| „ „ | 11.45 | 98.6 | ... |
| „ „ | 3 | ... | 100 |
| „ „ | 6 | ... | 100.5 |
| Jan. 24. | 9 | ... | 101.5 |
| „ „ | 11.45 | ... | 100. |
| „ 25. | 3 | 100.4 | ... |
| „ „ | 6 | 99 | ... |
| „ „ | 9 | 98 | ... |
| „ „ | 3 | ... | 99 |
| „ „ | 6 | ... | 99 |
| „ „ | 9 | ... | 98.4 |
| „ „ | 11.45 | ... | 98.6 |
| „ 26. | 3 | 98.8 | ... |
| „ „ | 11.45 | 99.5 | ... |
| „ „ | 3 | ... | 101 |
| „ „ | 9 | ... | 100 |
| „ 27. | 3 | 100.5 | ... |
| „ „ | 9 | 98.4 | ... |
| „ „ | 9 | ... | 100.5 |
| „ 28. | 3 | 100.6 | ... |
| „ „ | 9 | 100.6 | ... |
| „ „ | 9 | ... | 103.4 |
| At midnight | | 99 | |

Jan. 29.—Died at 6 A.M.

Joseph T., aged 19 years (P.M. Record vii. 109). He died the day after admission.

*Brain:* Convolutions flattened on both sides, and corpus callosum much arched. Fourth ventricle filled with blood clot. At the posterior part of the left cerebral hemisphere there was a subarachnoid hæmorrhage of the size of half-a-crown.

The right lateral ventricle contained some serum and a blood clot, but its walls were entire. The left lateral ventricle contained a large blood clot. The anterior part of its roof was entire, as was the ventricular surface of the corpus striatum, but at the back and outer part of the optic thalamus was an extensive rent communicating with a cavity in the brain substance, the walls of which were softened and its space filled with blood clots. This cavity extended under both the left optic thalamus and left corpus striatum as far as the anterior commissure forwards, and into the posterior part of the left cerebral hemisphere outwards and backwards, so that the clot penetrated the grey matter to within the thickness of thin paper of the outer surface. There was a small breach in the posterior part of the roof of the left lateral ventricle which was continuous with the cavity.

Between the optic thalami and in front of the corpora quadrigemina was a calcareous mass of hazel-nut size, from which numerous

points projected. This mass did not extend deeply into the brain substance. The choroid plexus was normal and was not adherent to it.

Arteries of the base not atheromatous.

*Heart:* Weight, 14 oz. Pericardium normal. Endocardium of left auricle and mitral valve showing numerous growths. Aortic valves slightly thickened.

*Liver and Spleen:* Engorged.

*Kidneys:* In each the scar of an old hæmorrhagic infarction.

Mary D., aged 65 years. (P.M. Record viii. 60). Died on the day of seizure.

*Brain:* Left cerebral hemisphere flattened and bag-like to the touch.

The left lateral ventricle was filled by a large clot. The hæmorrhage had destroyed the anterior part of the left optic thalamus and almost the whole of the left corpus striatum, and the roof of the left lateral ventricle was slightly torn. The right lateral ventricle was uninjured, but contained some serum and blood clots.

Arteries of base highly atheromatous; numerous small aneurysms were seen, but no ruptured one found.

*Heart:* Great hypertrophy of the left ventricle; valves and pericardium normal.

*Kidneys:* Showing chronic interstitial nephritis.

Rhoda M., aged 64 years (P.M. Record viii. 63). Died on the day of seizure.

*Brain:* Left optic thalamus yellow and softened; its inner part was broken down by a clot which extended forwards into the posterior part of the corpus striatum. The clot filled the lateral ventricle and penetrated the roof and cerebral hemisphere, extending nearly to the grey matter of the surface. Backwards the clot extended along the left crus cerebri just into the anterior part of the pons Varolii.

Arteries of the base highly atheromatous.

*Heart:* Left ventricle much hypertrophied; aortic valves with nodular growths. Aorta highly atheromatous.

*Kidneys:* In an advanced stage of chronic interstitial nephritis.

Thomas R., aged 56 years (P.M. Record vii. 345).

*Brain:* Four distinct hæmorrhages were discovered—one on the right side (I.), three on the left (II., III., IV.).

(I.) This was the largest. Its seat was the outer and upper wall of the right lateral ventricle. It extended forwards to within one inch of the apex of the anterior cerebral lobe and backwards to within 1½ inches of the occipital lobe. It had nowhere pene-

trated the wall of the ventricle, and in neither ventricle was there a clot. In the posterior cornu of the right lateral ventricle t here was a little reddish serum. A firm, ragged, and partially decolourised clot occupied the rent.

(II.) This was the second in size. It was in the occipital lobe on the left side, and was a cavity without contents but with yellowish walls. This cavity was pear-shaped and from an inch to one-third of an inch in width, the broader part being forwards. Its floor was edged by the external and inferior convolutions of the occipital lobe. At one part it extended into the grey matter.

(III.) A cavity in the centre of the left optic thalamus of the same internal appearance as (II.). It was of pea size.

(IV.) A cavity filled with a fresh well-formed blood clot $\frac{7}{10}$ inch in length and a quarter inch wide in the putamen on the left side. The tissue around the clot was not extensively softened, but was so in a very narrow tract.

The other parts of the brain were normal.

*Heart:* Weight, 13 oz. Slight hypertrophy of the left ventricle; valves and pericardium normal.

*Kidneys:* Normal.

The kindness of Dr. Gee and Mr. Boulter enables me to give the following summary of the notes of this case:—

The patient was a cabinetmaker, and was admitted into St. Bartholomew's on September 8. For a week he had had severe headache. On the day of his admission he had fallen down insensible while at work.

He had never had a fit before; but his friends had for some little time noticed that his manner was odd, and that he sometimes used mistaken names. His father had died in a fit at the age of fifty-eight years. A brother, still alive, had had two fits, and had become insane.

Sept. 9.—He was half insensible. He could both tell his name and spell it.

He tried to protrude his tongue, but could not do so.

There was complete paralysis of the left arm and leg, without rigidity. Pupils equal and natural. Slight flattening of left cheek, and breathing slightly stertorous.

Sept. 11.—He was less sensible, and the facial paralysis more obvious.

Sept. 12.—His left cornea was found to be almost insensitive, and the left facial paralysis was distinct.

Sept. 19.—His head and his eyes were persistently turned to the right. He was roused with difficulty, but could speak.

Sept. 22.—He kept his right hand to his head, and when asked how he felt, said "Very queer."

He had taken nourishment well.

Sept. 23.—He mumbled to himself. He was roused with difficulty to answer a question.

Sept. 29.—He was in a half sensible condition, but could be roused. He kept his head and eyes steadily to the right.

There was slight rigidity of his left elbow.

Oct. 2.—He seemed somewhat more intelligent.

Oct. 5.—Head and eyes were less turned to the right.

Oct. 7.—He had slight strabismus (right internal rectus).

Oct. 24.—Rigidity of left pectoralis major.

Nov. 5.—Rigidity of the muscles of his left calf was noticed.

Nov. 14.—About 1.15 P.M. he had a sudden seizure, and was for a time pulseless. He had no convulsions. His respirations were 36; his temp. 100.8°, and at 1.30 P.M. his pulse 144. His pupils were contracted, and he was completely unconscious. His left buccinator was puffed out with each breath.

He grew gradually weaker, his temperature fell, and he died twenty hours after the seizure.

Of the four hæmorrhages in the brain found post-mortem, that in the left corpus striatum (IV.) contained a perfectly fresh clot. It was no doubt that which had occurred on November 14, and was the immediate cause of his death.

The clot in the right cerebral hemisphere (I.) was partially decolourised. It was clearly older than that in the left corpus striatum, but more recent than the cavities of hæmorrhages containing no clots at all (II. and III.). It was the hæmorrhage of September 8.

The history of the case was not clear enough to enable the precise date of the two older hæmorrhages to be determined.

William T., aged 51 years (P.M. Record vii. 176). Died on fourth day after seizure.

*Brain:* The left lateral ventricle contained a large clot, and there was also blood in the third ventricle, in the iter, in the fourth ventricle, and a little in the right lateral ventricle.

In the anterior part of the roof of the left lateral ventricle there was a rent from which the hæmorrhage seemed to have proceeded.

An aneurysm as large as a split pea was found at the anterior origin of the left posterior communicating artery, but it was entire, and there was no effusion of blood at the base of the brain. The remainder of the brain substance was normal.

*Heart:* Weight, 18 oz.; hypertrophy most obvious in the left ventricle; valves and pericardium normal.

*Kidneys:* In an advanced stage of chronic interstitial nephritis.

Thomas C., aged 41 years (P.M. Record viii. 7). Died on day after seizure.

*Brain:* Upper surface without sign of disease. Some hæmorrhage under arachnoid on under surface of both occipital lobes. Pons Varolii, instead of being firm, was flattened and bag-like. There was a hæmorrhage of the size of a pea in the posterior part of the occipital lobe of the left cerebral hemisphere. It was a small, soft, dark clot. The whole centre of the pons Varolii was ploughed up by a large hæmorrhage, which extended downwards almost to the surface, upwards to close to the iter, which was, however, intact; backwards into the fourth ventricle, which was occupied by a clot, and forwards into the beginning of each crus cerebri, and on the right side just into the innermost part of the optic thalamus. The medulla oblongata was healthy.

Arteries of the base highly atheromatous.

*Heart:* Weight, 15¼ oz.; valves and pericardium normal.

*Aorta:* Slightly atheromatous.

*Kidneys:* In an advanced stage of chronic interstitial nephritis.

The patient had become comatose while travelling in an omnibus. He was completely comatose on admission, and never recovered the least consciousness. Both pupils were extremely contracted. His temperature rose to 107° before he died.

Frederick S., aged 56 years (P.M. Record viii. 25). Died on day after seizure.

*Brain:* Fourth ventricle full of blood. A large clot had ploughed up the whole left lower half of the pons Varolii, extending thence into the whole length of the left crus cerebri. The iter was entire, and the clot nowhere extended to right of the middle line of the pons. Rest of brain normal.

*Heart:* Hypertrophied; valves and pericardium normal.

*Aorta:* Highly atheromatous, with numerous calcareous plates.

*Kidneys:* Showing chronic interstitial nephritis.

He was quite insensible on admission, and both pupils were much contracted.

The morbid appearances in these fourteen cases show the close relation which exists between hypertrophy of the heart and cerebral hæmorrhage. In every single case the heart was larger than natural. In ten the hypertrophy was associated with chronic interstitial nephritis.

The old notion that a warning usually preceded an apoplexy is probably true of mental sensation in some instances, but these post-mortems show that an increased cardiac impulse is a much earlier and more constant warning, and one which is to be felt in nearly every case.

ON

# CERTAIN ABDOMINAL TUMOURS.

BY

J. WICKHAM LEGG, M.D.

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During the last few months there have been under my care in Luke's Ward and Mary's Ward several cases of abdominal tumours, the history of some of which I now venture to record. The diagnosis was confirmed after death in the greater part, but it has been thought justifiable to add to these some few cases of recovery in which the nature of the case was so cleared up by the removal of a specific fluid or by the course of the disease, that little doubt remained as to either the organ involved or the kind of disease. As so often happens, some of the most curious or obscure of the cases left the Hospital, and nothing further could be learnt of them. There would be little advantage, I apprehend, in giving the details of such imperfectly reported cases.

## Cases of Hardening of the Linea Alba and Umbilicus.

Within the last few years there has been rather a set made, if I may use this expression, at diseases of the umbilicus. Küster[1] and Blum[2] have published little monographs on tumours of the umbilicus, and several cases have been described in French and German journals. All these, however, have been cases in which the disease of the umbilicus has been prominent, so as to be noticed by the patient himself. The class of cases to which I wish to draw attention are somewhat different. The patient applies for some such symptom as vomiting or jaundice; the belly is therefore examined, and on palpation the umbilicus is not found markedly prominent, but hard and firm, and the skin around is adherent; or there is no change in the umbilicus itself, but the linea alba

[1] Küster, Arch. f. klin. Chir., 1874, Bd. xvi. p. 234.
[2] Albert Blum, Arch. gén. de méd., 1876, vol. ii. p. 151.

may be felt as a hard cord passing from the umbilicus to the pubes, or from the xiphoid cartilage to the umbilicus as well. In some healthy persons there may be felt in the linea alba, between the pubes and umbilicus, a certain thickness or firmness, which is not, however, very marked. In the cases in which I have seen this cord-like appearance in disease, it could not be mistaken for the natural linea alba or for the remains of the fœtal vessels in the neighbourhood of the umbilicus, as it came down below the top of the bladder and appeared to be attached to the symphysis pubis.

Hardening of the umbilicus, as a sign of malignant disease of the liver, has been known to physicians for several years, as I remember being taught it as a student in 1866 or 1867. I do not imagine, however, that it is a belief very widely spread. I can find nothing about it in the first editions of the treatises of Frerichs and Murchison, nor is anything said on this head in the very praiseworthy inaugural dissertation of Eduard Hess at Zürich in 1872, or in the article on cancer of the liver by Rendu in the "Dictionnaire Encyclopédique des Sciences Médicales," which is now being published at Paris. As to the hardening of the linea alba, I have met with no one who could tell me of a like case; and up to this moment I have been unsuccessful in my search for such in books.

Of what value this hardening of the linea alba will prove in the diagnosis of tumours of the belly yet remains to be proved. There can be no doubt that it is seen in some cases of malignant disease of the belly, as the two following cases show. I have seen it, also, from the umbilicus to the symphysis pubis in a patient of my own in Luke's Ward, who was deeply jaundiced, and had a large liver coming down to the navel, and in whom I suspected malignant disease, but his friends forbade his body to be opened. I saw such hardening also of the linea alba and umbilicus in a case of Dr. Church's, and in this man, before he died, the line had become a broad band an inch wide or more. Multiple tumours of the peritoneum were found after death. Some weeks ago I was also asked by Dr. Godson to see a woman with symptoms of stenosis of the pylorus. Hard nodules could be felt above the umbilicus, which were either in the wall of the belly or attached to the peritoneum of the wall of the belly. In the linea alba above and below the umbilicus could be felt a distinct hardening like a cord in the tissue.

Although in the three cases which were opened malignant disease was found, and in the other two suspected, yet nothing would be more rash than to infer that all cases of hardening of the linea alba are cases of malignant disease of the belly. At this moment I have under my notice a boy in whom other appearances lead to

the belief that he has tubercular peritonitis, and yet there is a very distinct hardening of the linea alba from the umbilicus down to the symphysis pubis.

Case I.—James B., aged 42, came to the Hospital for the first time on January 26, 1880, and was placed under the care of Dr. J. A. Ormerod. He then complained only of vomiting, which had lasted nine months, but he spoke of certain "lumps in the stomach" as an afterthought. I was enabled, by Dr. Ormerod's kindness, to examine the man on February 2, and could then readily make out the appearance to which Dr. Ormerod drew my attention, that is, the hardening of the tissues in the linea alba from the ensiform cartilage to the pubes. This hardening was very marked and the line very narrow, so that some who saw the patient suggested as an explanation the idea of calcification of the linea alba. About an inch from the ensiform cartilage, and at first sight appearing as if it were the ensiform cartilage itself, very moveable, was a small tumour, just under the skin, about the size of a horse-bean; and to the left of the hardened linea alba, in the hypogastric and iliac regions, were some ill-defined lumps not bigger than walnuts. There was at this time no ascites. A few days after this, the man was seen by Dr. Andrew, who considered the swellings and hard linea alba to be due to a malignant new growth. The vomiting continued till February 11, when it began to grow less. On March 8, Dr. Ormerod noted that there was distinct fluctuation of the belly. The hardness in linea alba had now become much wider, and the nodules to the left were larger.

He lost flesh rapidly, and he was admitted into Luke's Ward under my care on March 23, 1880. I ventured to make a diagnosis of malignant tumours of the belly, probably starting from the stomach. For the following notes I am indebted to Mr. Kinneir and Mr. Harper.

*Previous history.*—Patient has had good health till the present attack came on. He had a sore on the penis about eighteen years ago, and also had sores on his legs. He has been married sixteen years, and his wife has had several miscarriages, and there is only one child alive. He has also been a heavy drinker.

*History of present attack.*—About a year ago he was taken ill with vomiting; this occurred an hour or so after food. At the end of three months the vomiting ceased, but returned again at the end of two months.

About a year ago he also noticed five or six small lumps in the linea alba, each about the size of a small nut. The lump which is now seen at the tip of the ensiform cartilage was noticed about

eight months ago, and of late it has been growing. These lumps were not painful until quite lately. When first seen they were noticed near the pubes.

The belly began to swell two weeks ago; the legs, one week ago.

After food there is pain in the epigastrium. Lately no solids have been taken. Since the belly has become swollen, the pain in the epigastrium has been worse. The matters vomited are now and then sour. There has been no hæmatemesis and no melæna.

He has pain in the hypogastrium after micturition, and has lately passed very little water. There is no stricture, he says.

*Present state.*—A rather thin man; skin dry; face not very pale.

Nothing noteworthy in mouth, throat, or chest.

The belly is distended, and over its surface run prominent veins, which fill from below. The epigastric surface is raw from use of mustard poultices. The flanks bulge, and are dull to percussion, which dulness varies with position. There is distinct fluctuation from side to side.

A hard line reaching from the pubes to the ensiform cartilage can be very distinctly felt. Just below the ensiform cartilage there is a swelling, which at first sight is taken for the end of the ensiform cartilage projecting upwards; but it proves to be an inch below tip of ensiform cartilage, is rounded, and about the size of half a marble. On the left side of the linea alba there may he felt some indistinct swellings in the hypogastric region; not felt on the right.

Liver dulness begins on the sixth rib in front.

The legs, scrotum, and lower part of back are œdematous.

His appetite is bad. He cannot keep down his food for more than an hour. He complains of intense pain in the stomach, which is relieved by the vomiting.

The urine is scanty; acid; contains neither albumen nor sugar, and no blood. There is an abundant deposit of urates.

Temperature 98°, pulse 99.

He was put on a milk diet, with ten grains of bismuth three times daily.

Some relief to his pain was afforded by morphia injections, and during his stay in the Hospital vomiting was not so very marked a feature. Later on the belly became much distended; now and then there appeared a short-lived improvement, but his state never became really better, and he died on April 28, at six in the evening.

With the distension of the belly the lumps in the left side became less distinct.

The examination after death, on April 30, 1880, was made by Mr. Boulter at noon.

Body wasted, belly much distended. On opening the belly a large quantity of fluid, about three gallons or more, ran out.

The linea alba between the pubes and the umbilicus is one inch in thickness, a new growth having its seat apparently in the sub-peritoneal tissue. The new growth is white, dense, tough, and much thicker to the left than to the right of the middle line.

There are slight old adhesions at the apex of the right pleura. The pericardium is covered with a thin layer of soft recent lymph. The thin bands which cross the serous cavity are easily broken down. Both the auriculo-ventricular orifices somewhat dilated; otherwise the heart is quite sound.

Lower lobes of both lungs congested; the upper lobes are œdematous.

The whole peritoneal surface shows everywhere gelatinous semi-transparent nodules of various sizes, but the greater number are of the size of millet seeds.

The great omentum and mesentery are changed into thick hard masses formed of the same semi-transparent growth.

The great omentum formed a hard mass across the epigastric region, and was the tumour felt in that region during life.

The stomach was small, and in the middle there was a well-marked constriction, caused apparently by a thickening and contraction of the great omentum, which extended across it. The walls of the stomach from this constriction to the pylorus were about an inch thick, the inner side presenting the gelatinous semi-transparent appearance usually seen; the outer part of the thickening was uniformly dense and white. The disease stopped abruptly at the pylorus by a round and softened end of greenish grey colour. On the cardiac side of the contraction of the stomach the walls were also similarly diseased, but to much less extent, and gradually fading towards the œsophagus. The lining membrane of the stomach was soft and thick; otherwise it was not affected.

The liver was small. There were one or two fibrous nodules on the convex surface, from which fibrous bands led down into the liver itself. There were no other deposits, and no stone in the gall bladder.

The spleen was natural and the kidneys were pale; the capsule coming off with some little trouble.

Case II.—*Notes by Mr. Carrington-Sykes.*—George H., aged 54, porter, admitted into Luke's Ward on July 5, 1880. He has enjoyed good health up to eight months ago. He has, how-

ever, suffered (from slight attacks of gout in big toe twice ?) and rheumatism in knee-joint once; the latter (rheumatism) kept him in bed a fortnight. His family history is good.

He was seized eight months ago with a severe pain in his epigastrium (about an inch below ensiform cartilage and a little to the left of it). It was so bad that he had to take a cab to go home. The pain left him in about two hours. He was not yellow. He went to his usual occupation on the following morning (he is a porter). He was seized again two months afterwards with a pain in the same region, which was much more severe and lasted a longer time; and he still suffers from it, and is gradually getting worse, and was so bad two months ago that he had to give up his occupation, and has done no work since.

At the beginning he noticed a difficulty in swallowing solid food, and was sick after it; this is getting worse, and is so bad now that he cannot take solid food and very little liquid.

No trace of blood in the vomited matter.

The food, he says, stops in his throat, and he points to a place near the cricoid cartilage; the food does not pass beyond this; he has a little flatulence at the same time, *i.e.*, after he has vomited the food.

He describes the seat of pain as extending from the right hypochondriac region, through the epigastrium and left hypochondriac regions to his back, much worse on the left side. It extends up his back to left and right shoulders; the left is the worst; he also says the pain extends to lower part of left lumbar region.

A distinct band can be felt extending from his navel to a little above the symphysis pubis: it feels like a piece of cord running beneath the skin.

The navel is hard and contracted.

A nodule is felt just beneath the skin and to the right of navel.

There is dulness to percussion over nearly the whole of the belly.

He looks wasted, has lost much flesh; he has lost more during the last few weeks than before. He has suffered from constipation during the last weeks. Belly concave. Tongue clean, a little indented. Pulse 80, weak. Temp. 96.5° in armpit. Urine reddish-yellow or brick colour; reddish sediment; acid reaction; sp. gr. 1035; no albumen; contains urates.

The difficulty in retaining what he ate and the pain gradually increased; he grew weaker. An attempt to feed him with enemata of peptones was unsuccessful. The day before death all pain left him, and he died on July 22, at 3 A.M.

*Examination after death by Dr. Norman Moore.—Body:* Lean; no jaundice; no dropsy.

The umbilicus and a line from it to the symphysis pubis felt indurated.

*Chest:* Lungs. Some old adhesions at left apex, and a small calcareous mass with puckering in the apex; otherwise lungs normal.

Above the diaphragm the œsophagus was normal, except close to that muscle, where a slight hardness might be felt.

*Abdomen:* The stomach, from cardiac end to the pyloric orifice, was infiltrated with a firm, new growth. The capacity of the stomach was much reduced. There was a slight adhesion to the liver, and the tissue about the neck of gall bladder was much thickened, so that the cystic duct was completely closed.

The common duct was natural. The gall bladder contained much thickened bile, but no actual stone. Liver not infiltrated.

Pancreas harder than natural, and adherent to the stomach

Intestines normal.

Iliac glands
Supra renal
Kidneys
Bladder
} Normal.

Along hard line in linea alba were a few white specks; some fibrous tissue.

## Aneurysm of the Abdominal Aorta.

This is a case which seems worthy of notice on account of the light which the use of chloroform threw upon the nature of the disorder. Indeed, without chloroform, a definite and satisfactory diagnosis could hardly have been made during life. Two eminent physicians saw the man before he came under my care; one thought that the left lobe of his liver was enlarged; the other, that he had cancer of the head of the pancreas. When I first saw him in May last, he had a pulsating tumour in the epigastrium, lozenge-shaped, the two upper sides formed by the borders of the ribs, the two lower by lines which met in the umbilicus. The pulsations were most marked just above the umbilicus. Under chloroform this lozenge-shaped tumour disappeared. But there was left a tumour about the size of a hen's egg, the lower border of which was at the umbilicus, and which, when grasped, expanded laterally at each beat of the heart; it could only be moved very slightly, and this movement in no way affected the pulsations. On the man's death, a couple of months later, an aneurysm of the abdominal aorta was found.

Another point worthy of note was the presence of a diastolic murmur over the tumour, an appearance which neither Dr. Walshe [1] nor Dr. Balfour [2] has ever met with.

*Condensed from Notes by Mr. Callaway and Mr. Paterson.*—Alfred S., aged 34, was admitted into Luke's Ward on May 28, 1880.

Patient is a painter, and had an attack of painter's colic about eighteen months ago and another last Christmas. It was at this time that a pulsating tumour in the belly was found. He had a chancre seven years ago, which lasted for two months, and which was followed by sore throat for a month. Of an evening he has amused himself by making picture frames, and was thus in the habit of pressing pieces of wood into his belly.

*Present state.*—Heart's apex-beat and sounds natural; no area of dulness. Liver dulness begins at the sixth rib, but the liver cannot be felt below the ribs; the spleen cannot be felt.

In the epigastrium there is a triangular, or rather lozenge-shaped tumour, the lower half of which has its apex at the umbilicus, the upper at the xiphoid cartilage, while the sides are formed above by the ribs, and below by two lines which converge from the ribs to the umbilicus. The tumour is resonant to percussion, firm, pulsating, but gives no lateral expansion when an attempt is made to grasp it. In the tumour and around it he suffers much pain, so that he cannot sleep at night. Food causes much pain about a quarter of an hour after eating. The bowels are constipated; the fæces are pale yellow, pulpy; no oil floats from them when digested with water. The urine is acid, and contains no albumen and no sugar.

June 1.—To-day he was examined under chloroform. The tumour of the epigastrium disappears, but there can be felt almost in the middle line a strongly pulsating tumour about the size of a small hen's egg, or even smaller, the lower border of which is at the umbilicus, and the long diameter in a vertical direction. This tumour expands laterally when grasped with each beat of the heart. It cannot be moved far from the place where it lies, but only for a short distance, and this movement does not change the pulsations in any way. To the left of the umbilicus and a little above it, rather on the side of the tumour, is heard a double murmur, systolic and diastolic; the systolic murmur is much

[1] W. H. Walshe, A Practical Treatise on the Diseases of the Heart and Great Vessels, London, 1862, 3d. ed., p. 494.

[2] G. W. Balfour, Clinical Lectures on Diseases of the Heart and Aorta, London, 1876, p. 351.

louder and longer than the diastolic, but the diastolic murmur is well marked and very evident. The murmur is local and cannot be heard more than two inches below the umbilicus, nor can any murmur be heard to the right of the umbilicus or over the lumbar spines. Pressure over the spine gives no pain.

For about three weeks he was put upon Tufnell's treatment; but at the end of that time his temperature rose, and it was therefore thought advisable to discontinue the strict diet. Throughout he suffered great pain, which he bore with wonderful patience, always thankful for the little relief which the injection of morphia twice, thrice, or even four times a day gave him.

From the 14th to the 17th of July he suffered more pain, and brought up by the mouth a quantity of matter like coffee-grounds, while at the same time tarry motions were passed. On July 31, he was suddenly seized with great pain in the belly, with symptoms of collapse. A couple of hours before death the pain left him altogether.

The body was examined on August 2, 1880, at noon, by Dr. Norman Moore.—*Body:* lean; slightly jaundiced; much decomposed.

*Chest.*—Lungs emphysematous. Heart, weight 9 oz. Valves and texture normal.

*Abdomen.*—Just below the diaphragm and above the cœliac axis was a large aneurysm of the aorta. It was of fist size, and opened into the aorta by an orifice a little less than a shilling. The upper part of this sac was filled with firmly laminated fibrin. Below it had opened by two passages, one leading underneath the peritoneum, the other into the peritoneal cavity, in which there was a large quantity of serum and blood clots.

*Liver* normal. Gall-bladder greatly distended; ducts occluded. Stomach and intestines normal. No erosion on stomach. Spleen and kidneys normal.

## Perityphlitis complicated with Thrombosis of the Femoral Vein.

Thrombosis of the femoral vein seems to be somewhat rarely seen in typhlitis, as Bamberger is the only author that I can find who speaks of such a complication.[1] Portal thrombosis is, of course, common enough in perityphlitis, and there would seem to be no good reason why such a thrombosis as that of the femoral vein, seeing how near it is to the diseased part, might not arise from a propagation of the morbid change to the walls of the vein.

[1] Bamberger, Krankheiten d. chylop. Systems, Erlangen, 1864, 2te Auflage, p. 332.

*Notes by Mr. Oswald A. Browne.*—Joseph R., aged 41, a screw-maker, was admitted into Luke's Ward on October 8, 1879.

*History.*—He has had no serious illness, but has always been delicate, and has for many years suffered from flatulence and indigestion. On September 19 he felt extreme pain in the right iliac region; he thought it was cramp, and took brandy, with no relief. On 20th, and until admission, he attended Dispensary. Bowels open from injection on 21st.

For the last three or four days the pain has seemed to spread down the front of the right thigh and calf of the right leg. It is not so great in the iliac region.

*Present state.*—He sits in bed with his legs drawn up, and has done this for the last three weeks. Face somewhat drawn, and the countenance wears a thin, anxious, and dejected look.

Liver is natural. In the right iliac region, there is an indurated spot, not well defined to feel. This area is dull to percussion, and there is a slight increase of pain on pressure. There is no tenderness in the rest of the belly; the pain in the iliac region is increased by lying down.

In the right groin, in the place of the femoral vein, a firm, tender cord could be felt, apparently the vein filled with a thrombus. The thrombus extends apparently into the popliteal vessel, for the same firm cord, but smaller, can be felt in the ham. A superficial vein over the gastrocnemius and the saphena in its whole length could also be felt plugged.

Nothing worthy of much note in chest save a few mucous rales at each base. Pulse 96; artery thickened and a little tortuous. Bowels have been open four or five times daily up to 6th, and have been open to-day. Urine contains no albumen.

He was ordered to remain in bed with absolute rest, not to rise even to open the bowels or make water. The pain to be relieved by opium, and hot fomentations to the whole of the right leg, and iliac region.

The pain, under this plan, became less, so also the swelling in the iliac region; but the plugged vein could be still felt (Nov. 18) as a hard cord. Towards the end of the month, he was allowed to leave his bed. On December 11 he left the Hospital, no distinct swelling being felt in the right iliac region, but a small cord was still perceptible along the course of the femoral vein.

## Renal Tumours.

The first of the renal tumours, the case of the little girl, was partly under my own and partly under Dr. Gee's care. For the first few days of observation I was of the opinion that the tumour

was renal in origin, and that of renal tumours the diagnosis lay between malignant disease and hydronephrosis, and that the asserted rapid growth and large size of the tumour together with the age of the child made the diagnosis of malignant disease the more likely. Later on fluctuation could plainly be detected, and the fluid let out contained a small percentage of urea, about .16 per cent.; and the chemical analysis, together with the entire disappearance of the tumour, and recovery of the child, made it plain that we had had to do with a case of hydronephrosis.

The second case is one of malignant disease of the kidney, shown to be such by examination after death. During the time that I was in the post-mortem room, I met with nine cases of primary malignant disease of the kidney; and out of these nine, seven were on the right side. If we add the present case, it makes ten altogether, eight on the right side.

| | | |
|---|---|---|
| Girl . . | aged 8 ... | Left side (weighed 12½ lb.) |
| Woman . | „ 58 ... | Right (29 oz.) |
| Man . . | „ 54 ... | Right (right hydrocele). |
| Boy . . | „ 4 ... | Right. |
| Man . . | „ 36 ... | Right (kidney held to be a movable liver[1]). |
| Boy . . | „ 5 ... | Right. |
| Man . . | „ 36 ... | Left. |
| Man . . | „ 64 ... | Right. |
| Woman . | „ 44 ... | Right. |
| Man . . | „ 37 ... | Right (case now to be reported). |

As regards age in this table, there are only three out of the ten cases below the age of 10 years, three aged 36 and 37, one 44, two between 50 and 60, and one 64. The sexes are unequally divided, three being of the female, and the rest of the male sex.

I was struck with the preponderance both of the right side and of the male sex, and I thought it worth while to look further, and see if such proportion were maintained where larger numbers than my own were compared. In Rohrer's admirable monograph on primary cancer of the kidney, which is certainly the best of any that deal with this subject, there are tables given of all the published cases, 114 in all; 110 from books, and four of his own observation.[2] Of these 114, the disease was in the right kidney in

[1] This case was published in 1877 in vol. xiii. of these Reports, p. 144.

[2] Rohrer, Das primäre Nierencarcinom, inaugural dissertation, Zürich, 1874. I have been able to supply some details of English cases, the originals of which Rohrer was unable to see; and I have also left out Case 66 from my figures, as it is clearly the same as Case 95. This may account for any slight discrepancy between Rohrer's figures and my own.

51, in the left in 51, and on both sides in 12. In this matter, the larger numbers did not bear out the suggestion of the smaller, and the right side is seen to be as often affected as the left.

Rohrer says that in childhood the left kidney is more often affected than the right in the proportion of $2\frac{1}{2} : 2$, while in grown-up people the right is oftener seized upon than the left in the proportion of 5 : 4. When both kidneys are affected, the disease seems to be equally divided amongst grown-up people and children.

In the other matter, that of sex, the larger numbers and the small give much about the same result. Of the 115 cases given by Rohrer, 102 are available for this purpose. Of these cases, 69 were in men or boys, and 33 in women or girls, the remaining 13 being made up of cases in which the sex is not stated.

There is one very important outcome of Rohrer's figures upon which he lays due stress; and this is that one-third of all the cases are seen in the years between birth and ten, as the following table will show :—

| Age, . . . . | 0–10 | 10–20 | 20–30 | 30–40 | 40–50 | 50–60 | 60–70 | 70–80 |
|---|---|---|---|---|---|---|---|---|
| Number of cases, | 37 | 4 | 5 | 10 | 10 | 17 | 10 | 3 |

The earliest age given by Rohrer is three months.

I have somewhere seen it stated that in cancer of the kidney the testicle of the same side is often affected by a like disease. In my own case, there was a hydrocele of the same side; and I noticed the same appearance in one of the cases which some years ago I examined after death.

Case I.—*Notes by Mr. Brewitt and Mr. Harper.*—Henrietta H., aged 5, was admitted into Mary's Ward on March 19, 1880.

*History.*—Five weeks ago she was run over by a cart, the wheel ssing over the lower part of the abdomen. She was attended for ten days, and was then reported well. She kept her bed for some time, and was then sick several times, the vomit being of a green colour. Her mother then noticed a lump in the right side of the abdomen, which has gradually increased to its present size. No difference in the motions or the quantity of urine has been noticed; but there has been a white sediment in the latter, but no blood. The child has been running about.

*Present condition.*—A bright-looking, well nourished child. The thorax is pigeon-shaped, but otherwise natural.

On the right side of the abdomen is a hard elastic tumour,

which causes bulging of the flank, and is felt back into the loin. The surface is smooth, and the skin moveable over it. It is dull on percussion, and does not move with respiration.

The liver dulness is continuous with that of the tumour, but there is a palpable sulcus between them. The left lobe of the liver is not enlarged.

About the right iliac fossa a piece of intestine passes across the margin of the tumour, and gurgling is felt on pressure.

The tumour reaches to the median line at the umbilicus.

Nothing else abnormal can be felt in the abdomen.

The legs are natural.

Urine, sp. gr. 1025, alkaline ; a thick white deposit, soluble in acetic acid, thickening when boiled, and then soluble in nitric acid, that is, triple phosphates and mucus. Temp. normal.

Later on, very distinct fluctuation could be perceived in the tumour, and on the 14th of April it was punctured by Mr. Willett under gas. The puncture was made just outside the line of the erector spinæ, and $3\frac{1}{2}$ pints of clear fluid were drawn off. The wound was dressed with carbonised oil lint and strapped.

After the operation the tumour had entirely disappeared. She was sick.

April 17.—She appears well. The tumour is beginning to refill. There is some dulness in right flank. Temp. 96.8°, pulse 105.

20.—Seems lively. Tumour much the same. Temp. 101.8°, pulse 146.

24.—Seems quite well. The tumour is fairly distinct, but has not refilled to its original size ; does not reach the median line. Temp. 98.4°, pulse 96.

For the next two or three days it remained of much the same size, and she was discharged on the 27th.

On May 31 she came back, and on examination no trace whatever of a tumour in the right flank could be felt. Her general health was good.

On August 21 the child was brought again. She was in excellent health, and no tumour could be felt in the right flank.

*Analysis of the fluid from the tumour.*—Alkaline, sp. gr. 1010, opalescent. Contains alkali albumin. Boiled with acetic acid, precipitate fell of albumen (about one-twentieth). Gave purple reaction with KHO and a drop of dilute $CuSO_4$.

Was precipitated by acetic acid and $K_4FeCy_6$.

Gave the xanthoproteic reaction.

Contains .16 per cent. urea, as estimated by Russell and West's apparatus applied directly to the urine.

Another sample: a definite quantity of pure urea was added. The amount of nitrogen eliminated was very nearly proportionately increased, hence albumen present had not much effect in preventing the action of the hypobromite. A portion of the fluid was boiled with acetic acid, and the precipitate filtered off (the acid in excess held up the phosphates).

The filtrate was treated with an equal bulk of pure $HNO_3$, and boiled till nearly dry.

Remains were filtered and filtrate diluted with distilled water.

Filtrate was tested for salts.

*Contains sulphates.*—The filtrate, when *largely diluted,* gave white precipitate with $BaCl_2$.

*Contains chlorides.*—$AgNO_3$ gave white precipitate soluble in $NH_4HO$.

*Contains phosphates.*—On gently heating the filtrate with nitromolybdate of ammonium a yellow precipitate fell.

*Contains magnesium.*—Filtrate was neutralised with $NH_4HO$, then $NH_4Cl$ and $Na_2HPO_4$ added, and a very slight precipitate fell.

Murexide test did not show the presence of uric acid.

Case II.—*Notes by Mr. Oswald A. Browne.*—Alfred P., aged 37, was admitted into Luke's Ward on November 18, 1879.

*History.*—He has always been a very healthy man until three months ago. Six months ago he had a severe blow on the right side of the abdomen. For three months he has complained of loss of sleep and appetite and of a feeling of languor. Two months ago he began to feel pain in the right side of the abdomen, occasionally very severe when he walked. Six weeks ago he noticed a small swelling, the size of a chestnut, about two inches to the right of the umbilicus. The swelling, soft at first, has continued to increase in size and to become harder. He has slept badly for the last month, and very badly for the last fortnight, when the pain has been more severe. This pain has been heavy, aching, burning, not so much in the swelling itself, as at the bottom of the back and below the tumour. The pain is greater if he lie on his left side.

He has lost flesh since the beginning of the illness.

*Present state.*—There is a hard swelling on the right side of the abdomen, filling up most of the space between the ribs to the right of the middle line and a plane on the level of the anterior superior iliac spine; the tumour extends far into the lumbar region. The swelling is of uniform hardness, fairly smooth, not nodulated, not tender on pressure. There is no fluctuation and

no pulsation. The tumour is dull on percussion everywhere. It moves very little, if at all, on inspiration. The tumour is fixed, while the skin is moveable over it. The most prominent point is one or two inches to the right of the umbilicus.

There is a hydrocele of the right tunica vaginalis, and a few enlarged glands in each groin.

The cardiac impulse is almost imperceptible; the apex beat is in the normal situation; no murmur with the cardiac sounds. Lungs normal. Liver-dulness begins at the fifth rib in the nipple-line. There is no line of resonance between liver-dulness and that of tumour.

There is a good deal of pain on defæcation; the motions are solid, abundant, of a black colour. Urine, pale, acid, mucous cloud; no albumen.

Nov. 25.—The tumour seems to reach farther round into loin; there are some superficial veins on the right side, which are distended. There is some pain after passing urine, and he says it has come away slowly at times for the last two or three days.

Dec. 3.—Tumour now more prominent, and increasing towards middle line, passing almost into epigastric region. A small tumour the size of a marble close to the inguinal ring. There is much vomiting to-day and yesterday of a greenish fluid. He says he feels ill. Temp. 101.4°.

He died on January 11, 1880.

*Examination by Dr. Norman Moore thirty-six hours after death.*—The belly was filed by a large mass, firmly adherent in the right lumbar region; it extends across the middle line as far as the edge of the left kidney. The cœcum and transverse colon are nearly empty. They lie in front of the mass and are adherent to it, but do not form part of it.

The right ureter is surrounded by the mass; and two and a half inches above the bladder, it is so pressed on as to be completely occluded.

The vena cava inferior is completely closed, and the aorta much pressed on.

The mass is formed above by the right supra-renal body, which is as large as a man's fist, by the right kidney, greatly enlarged and infiltrated with the new growth, and by all the neighbouring glands.

The omentum contains a few small masses of new growth, but is for the most part healthy.

The wall of the intestine is nowhere penetrated.

Left kidney normal; weight, 5 oz.; ureter pervious.

In rest of body nothing worthy of note.

# TWO CASES OF AURAL EXOSTOSIS.

BY

A. E. CUMBERBATCH.

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I venture to think the two following cases of sufficient importance for publication, because of their rarity, and because of the treatment adopted.

Before proceeding to describe them, however, I must say a few words about the ætiology of aural exostosis.

What do we mean by an aural exostosis?

Dr. Cassells, in a short but admirable paper in the "British Medical Journal" for December 1877, defines it thus:—"Premising that an aural exostosis and hyperostosis are totally distinct affections in regard to origin, situation, form, and treatment, an aural exostosis is benign in origin, only to be found on the outer half of the external meatus, has its point of attachment *always* at the posterior wall, is pedunculated, and has its origin in the periosteum of the mastoid, close to the meatus." According to this definition, the cases about to be described are not exostoses, but hyperostoses.

If Dr. Cassells' account of the ætiology of the true exostosis be accepted as correct, it would certainly avoid confusion to call all other bony tumours of the meatus, hyperostoses, and if I call those described further on exostoses, it is not because I dispute his definition, but merely for present convenience; for I find one or two writers have accepted Dr. Cassell's definition, and have then proceeded to describe cases of *exostosis*, which are not exostosis according to him, but hyperostosis.

It is not an easy matter to trace the complete history of the tumour Dr. Cassells describes. I have seen the subperiosteal abscess, polypoid granulations, exostosis; but have not yet been able to trace the conversion of the granulations into bone; for all the cases I have seen have been in out-patients' practice, and it is

notorious how difficult it is to keep an out-patient under observation for any length of time, in spite of every effort made to do so.

Reserving judgment, therefore, about these exostoses, I wish rather to call attention to the etiology of such tumours as would, according to Dr. Cassells, be named hyperostoses.

They grow slowly, usually without causing any inconvenience; and, oftener than not, are discovered by the patient seeking aid for his deafness; they may be situated on any part of the meatus, but oftener at the postero-superior wall, near the membrane; sometimes single, but generally two or more; they are situated on a broad base, but this base is sometimes constricted. Their structure is very dense, and they rarely attain sufficient size to completely obstruct the meatus. In all the cases I have seen, these exostoses have been associated with a considerable amount of deafness, and in all except two the deafness has been due, not to the mechanical obstruction of the meatus, but to concomitant disease of the middle ear.

It is still a debated question how these tumours arise. The older writers were inclined to attribute their origin to gout or syphilis, but more modern writers rather ascribe their origin to some local irritation, especially prolonged suppuration of the middle ear.

I venture to think, however, from a careful examination of the cases I have seen, that gout is the exciting cause in a large number of these exostoses, and Von Troelsch, although he does not allow that these tumours are gouty in origin, admits that many occur in persons of middle age who have lived well. Out of eleven cases in which I have been able to obtain complete histories, there were in seven instances associated the symptoms which, for want of a better name, we call gouty; in two there had been well-marked attacks of gout; and in two only could no such history be obtained. In one of the remaining two, there had been previous suppuration of the middle ear. All occurred in patients at or past the prime of life, and in all there was associated catarrh of the middle ear. In eight the catarrh was not amenable to treatment. In further confirmation of gout being an exciting cause, I may add that I have been struck by the far greater frequency of these tumours in private than in Hospital patients.

I have said that these exostoses rarely attain sufficient size to completely obstruct the meatus, and unless they threaten the retention of secretion, they had better not be interfered with.

When the meatus is completely obstructed, I have long thought that the final closure was due more to the swollen condition of the skin of the meatus than to any increase in the size of the tumour, and was temporary. It therefore occurred to me that if the

skin over the exostosis could be replaced by a thin cicatricial tissue, the swelling at each attack of catarrh would be prevented; and the success attending the treatment in the two following cases would appear to justify the assumption. In defence of this palliative treatment I would add that these exostoses are very hard; that it is often impossible to judge how broad their bases may be from without inwards, and hence the operation for their removal is a serious and difficult one, and may fail.

B. J. was seen September 21, 1876.

Has been subject to frequent slight attacks of non-purulent catarrh of the middle ear for several years.

About three years previous to seeing him, after a severe cold, he had an attack of purulent catarrh of both tympana, associated with considerable deafness. He was treated by a well-known aural surgeon, who discovered and removed from the left ear a polypus. After being under treatment for a short time the discharge ceased and hearing was restored.

When I saw him I found the following condition of his ears:—

Right meatus much narrowed by a general horny thickening, the passage being diminished about one-half its normal diameter; and the skin of the meatus is very vascular and swollen. The membrana tympani is imperfectly seen, but no perforation can be detected.

In the left meatus is seen a single exostosis, situated on a broad but somewhat constricted base, growing from the posterior wall, rather nearer the roof than the floor of the meatus, and quite occluding it. The skin of the passage is, as in the other ear, very vascular and much swollen.

The hearing with the right ear is nearly normal, but with the left ear the watch is only heard when pressed closely against the pinna. The patient is also suffering from nasopharyngeal catarrh.

A leech was applied to the left tragus, the throat was painted with a solution of chloride of zinc, and a nasal douche of bicarbonate of potash was ordered to be used every night. The tympana were also inflated by the air-douche.

Sept. 27.—Nasopharyngeal catarrh much less; the skin of the meatus not so congested, and the summit of the exostosis is no longer in contact with the anterior wall of the meatus.

With the left ear the watch is heard at one inch distant (the normal hearing being about 78 inches); after inflation, 4 inches.

As the patient complained of a feeling of fulness in the left ear, and being sure that the obstruction of the meatus was in part due to the swollen condition of the skin over the tumour, I determined to apply strong nitric acid, hoping by the subsequent cicatrisation to increase the width of the passage permanently.

Placing the patient under the influence of æther, and protecting the anterior wall as far as possible, all the surface of the tumour which could be reached was burnt and then washed with a solution of soda. The next day the meatus was occluded by the inflammatory swelling caused by the nitric acid. The ear was syringed frequently with warm water, and on the separation of the slough with a weak solution of sulphate of zinc; and, as was anticipated, when the surface healed, the space between the exostosis and the anterior wall was much increased.

In a note taken October 26, I find "the space between the tumour and anterior wall nearly $\frac{1}{8}$ inch wide; catarrh gone; hearing with the right ear normal, with the left 48 inches."

I have seen the patient at intervals since then, and although he has had several attacks of non-purulent catarrh of the middle ear, the cicatrix over the exostosis has prevented the occlusion of the meatus, and the exostosis up to the present time has not increased in size.

B. S., a stout florid man, was seen May 28, 1877, with a history of gradually increasing deafness during the last six months.

On examination the skin of the right meatus is found to be very vascular; the membrane also is vascular at its periphery, and a few vessels are seen running parallel with and behind the handle of the malleus.

The membrane is somewhat retracted at its anterior part.

The left meatus is nearly occluded by an exostosis growing from its posterior wall, about half way.

The skin of the meatus is vascular and swollen, especially over the tumour; the throat is also much inflamed. The watch is not heard with either ear till after inflation with the air-douche, when it is heard on contact.

The patient acknowledges that he eats three large meat meals a day, and drinks beer rather freely.

He takes no exercise, feels sleepy the greater part of the day, and invariably falls asleep after dinner and tea. He suffers from dyspepsia, often has pains in his knees and loins, and his water deposits a sediment on standing.

Ordered to take very little meat for breakfast and none for tea; to take exercise every day after dinner, and to avoid, if possible, sleeping during the day; also ordered a gargle of alum night and morning, a powder of citrate and iodide of potash every night, and half a tumbler of water. The throat was painted with a solution of chloride of zinc when seen, and a leech applied to the tragus that night.

May 31.—The skin of the meatus not so vascular, and the patient is feeling better. The watch is heard in contact in both

ears; inflation with Politzer's bag does not perceptibly improve the hearing as tested by the watch, but my voice is heard better.

Remembering the good effect produced in the former case by the application of nitric acid, the anterior wall of the meatus was protected by a small strip of platinum, and the surface of the exostosis freely burnt.[1] As the patient was obliged to leave town the following day, he was advised to pursue the same general treatment, and in addition to take a wineglassful of Hunyadi Janos water every third day.

He was seen again on June 10th, and the space left in the meatus was sufficiently wide to allow the escape of any secretions; there was hardly any congestion of the throat or ears.

The watch could be heard with the right ear about one inch distant, and with the left about three-quarters of an inch, and he could hear my voice quite easily from the extreme end of the room.

I saw him again on October 12th, and found that all congestion had subsided, the space between the exostosis and the anterior wall of the meatus remained about the same, and he could hear the watch with either ear at about twelve inches off. He feels perfectly well, and has not the slightest difficulty in hearing general conversation.

[1] I shall try the galvanic cautery in the next case I have to treat.

# TWO CASES

OF

# "ACUTE ARTHRITIS OF INFANTS."

BY

W. MORRANT BAKER.

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In the tenth volume of the Hospital Reports, Mr. Thomas Smith drew attention to a formidable affection of the joints in children, often fatal, which had not previously received a special description, and for which he proposed the name of "acute arthritis of infants." The disease appears, from Mr. Smith's dissections, to be essentially an affection of the articular extremities of the bones; there being, in all the cases examined, a considerable loss of substance in the articular end of one of the bones entering into the formation of the joint affected.

"In some cases this absorption or ulceration has proceeded from the joint-surface towards the deeper parts," while "in others the destruction of tissue had commenced in abscess within the articular end of the bone, which, after excavating and destroying more or less of the interior of the bone, had burst into the joint by a small opening near the margin of the articular cartilage." The disease has neither a traumatic nor syphilitic origin, although, in some respects, it bears a superficial resemblance to the syphilitic affection of the epiphyses, to which, of late, attention has been frequently called.

These cases, it appears to me, are at present not too well known; and I venture therefore to record additional examples in the present volume of the Hospital Reports. They illustrate no new facts; but they may serve an useful purpose by giving a reference to the paper by Mr. Smith, and by contributing to the number of cases now available for statistical purposes.

### Case I.

An infant, six months old, was sent to me by Dr. West (March 5, 1880), on account of disease of the right knee-joint, of six or seven weeks' duration.

I found on examination that the joint was evidently distended by fluid; and, on making pressure, sanguineous pus oozed from a fistulous opening on the outer side, which, I was told, represented the spot at which an abscess had been punctured a week or two previously. The lower end of the femur seemed considerably enlarged, as if from osteitis. The child was pale, but fairly healthy, and not so much distressed by the disease as one might have expected. Its rest had been a good deal disturbed by pain.

March 9.—Not being satisfied with the opening which existed for the escape of pus, chloroform was administered, and I opened the joint on both sides of the patella opposite its lower third, and let out about half an ounce of pus. Subsequently, it was found that a probe could be readily passed across the interior of the joint beneath the patella. No dead bone could be detected; and I could not feel any bare bone on probing through the sinus which already existed on the outer side higher up. Some lateral movement of the tibia on the femur, as if from loosening of the ligaments, could be readily felt on examination.

Fomentations and linseed meal poultices were ordered.

March 16.—The knee is less swollen, and said to be much less painful. The general condition of the child is about the same.

From this time onward a gradual but steady improvement took place, both in the local conditions and in the general health; and the following note was taken a month afterwards.

April 16.—There is now much less swelling of the joint, and much less apparent enlargement of the lower end of the femur. The motions of the joint are free, with the exception that the tibia cannot be quite completely flexed or extended. There is no pain produced by the movements at the joint; and the child is said to kick about with one leg almost as much as with the other. All the wounds are now healed. Only very slight lateral movement of the tibia on the femur can be now detected.

The last note which I have is dated April 27th. The child is now much improved in every way. All the sinuses remain healed, and there is but little swelling. No pain is caused by flexion and extension, and the leg can be now almost, but not quite, straightened. Scarcely any lateral movement can be detected. The general health is extremely good.

## Case II.

A male infant, aged nine weeks, was brought to me at St. Bartholomew's Hospital, August 7, 1880, on account of disease of the knee-joint, with symptoms almost identical with those of Case I. Much puffiness existed on each side of the patella, as if from distension of the knee-joint, and there was a fistulous opening, discharging pus, opposite the internal condyle. The general appearance, indeed, was exactly like that of a joint undergoing acute inflammatory disorganisation.

The swelling of the knee was first noticed when the child was four weeks old, and it increased gradually until it broke and began to discharge spontaneously a fortnight afterwards. Notwithstanding the escape of pus, however, the joint became steadily more swollen and red, with no improvement in any of the symptoms, up to the date of the child's being brought to the Hospital.

Chloroform was given, and I made a free puncture into the knee-joint on the inner side of the patella. Blood flowed very freely from the puncture, and I could not detect any pus in it; but, from the relief given, I fancy pus or other fluid must have escaped, although concealed by the hæmorrhage.

August 9.—Very great improvement has apparently resulted from the opening into the joint. All the local symptoms are much better.

From this time the record is only one of continued improvement, and on September 2 it is noted that the diseased knee-joint now looks almost like the other. The sinuses are healed. The puncture made below the patella is scarcely perceptible. The sinus-scar over the internal condyle is more solid, and is adherent to the deeper textures. The movements of the knee are free and smooth, and painless. The leg can be, however, not quite completely extended.

October 25, 1880.—The knee is apparently well. The child moves the limb freely in flexion and extension, and the leg can be almost, but not quite, fully straightened.

# CASES OF SYPHILIS.

BY

C. B. LOCKWOOD.

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During a year passed at the Male Lock Hospital many interesting cases of syphilis presented themselves. The following, which have been selected from them, may possibly help to elucidate the pathology and treatment of this most interesting disease.

Avoiding discussion as to the relative identity of hard and soft sores, these terms may be used to distinguish sores of which the former is usually the precursor of constitutional disease, the latter merely local in its course and effects. But this is not invariably the case, for a patient was admitted who had a suppurating sore and open buboes in both groins, The sore got rapidly well and the buboes were healing, when a sore throat came on accompanied by a pigmentary syphilide upon the chest and abdomen. This eruption resembled ordinary roseola in the shape and position of the patches, but it was brown instead of being rose-coloured. Syphilides are frequently pigmented just before disappearing, rarely at the commencement.[1] Here then is an instance of a soft sore with suppurating buboes preceding constitutional syphilis.

As an aid to diagnosis, the mere number of sores present in any case or the amount of induration accompanying them could not always be relied upon. Sores are but points of inoculation exactly analogous to those produced in vaccination. It might therefore be expected that there is practically no limit to their simultaneous production. An Italian presented himself with fifteen small indurated sores around the corona; these were not followed by unusual constitutional symptoms. Another patient had five most typical parchment sores. One was near the orifice of the prepuce, three upon sheath of penis, and one upon the pubes. In this case an important practical rule was exemplified, viz., that sores situated

[1] *Vide* Lancereaux, vol. i. p. 152 (Syd. Soc. Transl.)

upon the sheath of the penis are almost always syphilitic; indeed suppurating sores are rarely met with except upon a mucous or muco-cutaneous surface. They are excessively rare about the face or head.[1] The following table may help to show the number of syphilitic chancres present in the cases which presented themselves.

Out of 675 patients examined, 161 had undoubted syphilis.

One sore was present in 84 cases.

Two sores were present in 17 cases.

Three sores in 5 cases.

Urethral sores in 6 cases.

Sores of sheath in 1 case.

Syphilitic phimosis in 14 cases.

Twenty-four cases had various eruptions, the sores having disappeared before they presented themselves.

It did not appear possible in any case to judge accurately from the character of the sore what form or degree of constitutional disease would supervene.[2] A youth aged sixteen came with what was considered to be a small suppurating sore; there was no typical induration of the inguinal lymphatic glands. This sore was followed by rupia and ulceration of the fauces, alæ of nose, and eyelids, all of which continued many months. He afterwards became paraplegic. In other cases large and severer sores were followed by apparently slight constitutional disease.

Acute phagedæna was present in several instances, being due, it seemed, to filth, neglect, and want of food. Open buboes were oftenest attacked. The destructive action commenced in the cutaneous margins of the bubo; usually the lymphatic gland remained exposed in the midst of the surrounding destruction; a result due partly to the protection afforded by their fibrous capsule, partly to their deeper and more abundant blood supply. This acute form of phagedæna seems not to originate in syphilis, and was in no case followed by it. A more chronic form of phagedæna is exemplified by the following case. The patient was a man aged fifty-eight, tough and wiry, with no evidence of senile decay. He had been a widower about two years. He had never had any venereal disease before. In March 1879 he was exposed to contagion, and a month afterwards a sore came upon the glans penis, accompanied by slight sloughing and gradual ulceration. By June 30th two-thirds of the glans penis was destroyed and the ulceration had slowly extended to the pubes. The inguinal glands were natural. After immersion in hot baths seven hours daily and the application of iodiform, the disease was arrested. In August, six months after contagion, he had no symptoms of

[1] *Vide* Bumstead on Venereal Diseases, Philadelphia, 1865, p. 336.

[2] *Vide* Carmichael, Essay on Venereal Diseases, Dublin, 1814.

constitutional syphilis. The person from whom he had acquired his sore was examined. She was a lady's-maid, and said that in March she had had a small sore, but thought it of little consequence. When examined in July she had enlarged and indurated inguinal glands and condylomata at anus and in her throat.

When considering the question of the curability of syphilis, it is important to determine whether the same person can have more than one complete attack. Diday collected a number of cases bearing upon this point, but none of them was so curious as the following. The patient was a medical man and thoroughly competent to record a fact. In 1873 he had an indurated sore followed by roseola, alopecia, angina, psoriasis, sarcocele, and iritis. For these he underwent mercurial treatment a year. He seemed to have quite recovered, and iritic adhesions were the only visible remains of the attack. In 1877 he again acquired an indurated sore followed by induration of the inguinal lymphatic glands, psoriasis over body, palms of hands and tongue, also complete alopecia. These symptoms gradually yielded to mercurial treatment. Curiously enough he asserts that he has had measles twice, scarlatina twice, and small-pox three months after vaccination. Few people can have such an extensive personal experience of disease.[1]

Amongst the cases of general syphilitic eruption, the following was one of the most interesting. A male patient whose body was deeply scarred by small-pox came with an indurated sore, indurated inguinal glands, and roseola. The patches of roseola confined themselves entirely to the small-pox scars, causing a strange and perplexing appearance. As the roseola went away the scars assumed their ordinary appearance.

No organ or structure seems to be exempt from the ravages of syphilis. The bursæ are not exceptions. In a male patient, the subject of severe disease, both bursæ patellæ became enlarged and acutely inflamed. Suppuration occurred in the right followed by extensive and persistent ulceration; the left subsided and but slight thickening was left. None of the other bursæ were affected; no injury or undue pressure could be found to account for its occurrence in the bursæ patellæ. Other cases of a similar nature have since been observed in which inflammation and suppuration took place in bursæ during the progress of an acute attack of syphilis.

Cases of paralysis of the muscles which move the eye are by no means rare. The following would have but little interest were it not thought possible from the mode of onset and progress of the disease to localise the seat of lesion. A year after the commence-

[1] This case was not a patient at the Male Lock Hospital.

ment of his disease a male patient had paralysis of the external rectus, supplied by the sixth cranial nerve; next the cornea, conjunctiva and forehead, all supplied by the orbital division of the fifth, became insensible; this was followed by ptosis and paralysis of the other recti, due to a lesion of the third nerve. Finally, the eye became motionless, the pupil dilated, and the power of accommodation lost. There was no alteration in the retinal vessels or insensibility of the infra-orbital region. Since, therefore, the orbital division of the fifth nerve was affected, but not the infra-orbital, the lesion was anterior to the Casserian ganglion; and since the retinal veins were normal, it was posterior to the entrance of the ophthalmic vein into the cavernous sinus; or, in other words, upon the wall of the cavernous sinus. It is also to be observed that the nerves were affected in the order in which they lie in its wall from below upwards. The fourth nerve was thought to be paralysed, but the proof was difficult. It might be presumed that the paralysis was due to a syphilitic inflammation which travelled from below upwards on the wall of the cavernous sinus. After the exhibition of mercury and iodide of potassium, the nerves began to recover; this took place in an order the reverse of that in which they were affected. An internal squint came on, making it probable that the sixth nerve, which was affected first, had been permanently damaged by continued inflammation.[1]

Amongst the female out-patients few points of interest presented themselves. For many reasons they afforded dubious materials for correct observation. It was thought to be observed that ovaritis occurred more frequently in the cases of women who were syphilitic than in those who were not. Analogy would lead to the belief that syphilitic ovaritis was possible, but the difficulty to prove such to be the case would indeed be great.

In the numerous cases of syphilis which came under observation, a mercurial plan of treatment was generally adopted. Cases, however, occurred which were alleviated neither by mercury nor by iodides. In three cases it was attempted to relieve the symptoms by means of sweating caused by one-sixth grain doses of nitrate of pilo-carpin (*Jaborandi*), administered every night or every other night. There is nothing new in the treatment of syphilis by sweating; it has been practised from very early times. To produce it by means of pilo-carpin is unusual. This method of treatment was first tried in the case of John S., aged 18, a fisherman, who had been an out-patient from October 1878. Owing to exposure his syphilis was aggravated, and when admitted in November 1878, his body, head, and limbs were covered with

[1] See also "Medical Times and Gazette," 1879.

small dry rupial crusts, which left, as they came off, deep reddish-brown discolourations. On the palate and tonsils were mucous patches. The gums were vascular and retracted. In both eyes iritis was present. For fifteen days the treatment with bichloride of mercury and iodide of potassium was continued without improvement. Calomel vapour baths were next tried for thirteen days (January 17th to 30th), but still without effect. In such a case as this Zittmann's treatment might have been tried. This, however, entails confinement for weeks to a warm room, frequent purging, and copious draughts of Zittmann's decoction. It seems possible that this method of treatment owes its success in some degree to the profuse sweating it produces. It is true that all the other excreting organs are kept in a state of activity. Having determined to try the effects of sweating upon John S., the calomel in his bath was reduced from 15 to 5 grains, and one-sixth grain of nitrate of pilo-carpin was injected subcutaneously every other day before the bath. Before this no sweating had been caused by the baths, it was now so profuse that it ran off the patient on to the floor, continuing from 7 P.M. until 4 A.M., wetting the bed-clothes through and through. He at once began to improve, and on March 7th, after about thirty-three days' treatment (fifteen injections of pilo-carpin) all the rupial crusts had fallen off, the stains were fading, the throat was well, and his eyes were only slightly pink. He desired his discharge, became an out-patient, and was then treated with one-half grain doses of green iodide of mercury twice daily. In August he had had no relapse.

In the previous case much mercury had been administered. J. S., aged 27, had had, as far as could be discovered, no mercurial treatment. He presented himself in the following condition:—Body, limbs, and face covered with a profuse tubercular psoriasis; slight ulceration of both tonsils, and a hard sore. On February 17th one-sixth grain of nitrate of pilo-carpin was injected hypodermically. Profuse sweating began in six minutes and lasted three hours and a half. The pilo-carpin was repeated from February 18th to 20th each day, then every other day until March 6th, when the sore was healed and only fading stains remained where the eruption had been. The throat was still slightly ulcerated. He, however, considered himself cured, and in spite of remonstrance took his discharge.[1]

In a third case, a large crop of condylomata and a tubercular syphilide disappeared in twenty-five days, pilo-carpin being administered almost every night during that period. This patient went away, but returned in five weeks with lingual psoriasis. It seems almost fair to argue that had the pilo-carpin

[1] See also "Medical Times and Gazette," April 19, 1879.

been continued for a month the chances of a speedy relapse would have been diminished.

The most striking feature in these three cases was the rapidity with which the symptoms disappeared. In none of them was the slightest bad effect observed. The frequency of the doses of pilocarpin was regulated chiefly by the amount of sweating produced. It could not be claimed for pilo-carpin that its use was indicated in every case of syphilis. Further experience would be required to show when it will be most useful, but the experiments briefly described above show that it is of some efficacy in removing the outward signs of this disease.

# CASE OF CONGENITAL ABSENCE OF ONE OLFACTORY BULB.

BY

T. CLAYE SHAW, M.D.

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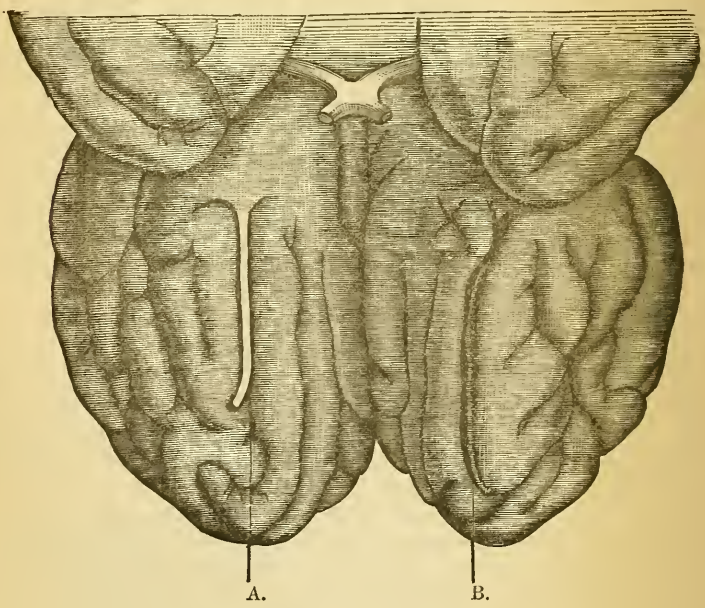
It is not uncommon in the brains of the insane to meet with irregularities in the distribution of convolutions, with absence of commissures or defective development of lobes. Curious anomalies are also met with in the alteration of position of viscera, or even in complete absence of some. Thus, a short time since I made a post-mortem examination of a woman in whom there was an absence of both ovaries and the left kidney. She had never menstruated, and had been married nine years. She was also epileptic. As far as I know, the case I am about to relate is unique, and the defect was not suspected until revealed on post-mortem examination.

A. K., a female aged 53, had been insane more than twenty years. She was epileptic and demented, at times violent; but no warning was given of her attacks, no aura of any kind noticeable. During life no defect in her sense of smell was observed. She could eat and appreciate different kinds of food, but was too demented to make any remarks about any subjective feelings of sense alteration that she might have felt.

After death there was noticed a great difference in the convolutions of the lower surfaces of the frontal lobes, and an absence, which must have been congenital, of the right olfactory lobe and its prolongations backwards and downwards. A drawing by Mr. Godart of the lower surface of the frontal lobes is given, and the specimen was kindly examined by Mr. Walsham, whose opinion is that there was no trace of the nerve either in its roots, body, or prolongations. Any doubt that might exist is removed by examination of the ethmoid bone, in which the perforations of the

cribriform plate on the right side are wanting; in fact, there is, strictly speaking, no "cribriform" plate, the dura matter passing smoothly over it, in strong contrast to the appearance of the left side. An examination of the plate shows a sulcus on the right lobe corresponding to the olfactory sulcus on the left side; but the posterior extremity of the sulcus is wanting in the elevated, bulbous, transversely-placed convolution from which the middle root of the olfactory lobe springs. Neither can either of the other two roots be traced, inwards towards the perforated space, or outwards towards the fissure of Sylvius. The arterial distribution about the fissure of Sylvius was unfortunately not especially noticed, but there is no reason to believe that any abnormality would have been found. The convolutions on the two sides in the tempero-sphenoidal lobes were symmetrical, and nothing abnormal was noticed in the special convolutional part supposed to be associated with the sense of smell.




A. Normal olfactory sulcus and nerve.
B. Olfactory sulcus with absence of olfactory nerve.

# PERIMETRITIS AND PARAMETRITIS.

BY

WALTER S. A. GRIFFITH.

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It is only a few years since Bernutz of Paris defined and described perimetritis as a distinct form of pelvic inflammation; and as no clinical history of cases has yet been published, I have collected the cases which have been admitted to Martha between October 1877 and October 1879, more with the view of illustrating Dr. Duncan's lectures on the subject than with the hope of being able to add anything new to his complete description.

The greater number of these cases have been under my own observation, but I have made free use of the notes of my predecessors, Mr. Husband, Mr. Burn, Mr. Clarke, and Mr. Garstang, in the Ward Register.

There seem to be two reasons why these diseases have not been long ago recognised and differentiated, namely, the absence of the habit of making vaginal examinations, without which a large proportion of them cannot be diagnosed, and the absence of post-mortem examinations; for these diseases are rarely fatal; but the few recorded are sufficient to show that we are working on a right basis. There is such a disease as perimetritis, and there is such a disease as parametritis, frequently existing together, but more frequently alone, or at least one predominating so much as to constitute the chief part of the disorder, and presenting distinctive characters by which it may be recognised.

Perimetritis is an inflammation of the peritoneum covering the female pelvic organs, the uterus, broad ligaments, and ovaries, the bladder, rectum, and any part of the small intestines that lie over these organs and close the inlet of the pelvis.

Parametritis is an inflammation of the cellular tissue which underlies the peritoneum, enveloping and connecting these

organs to each other and to the walls of the pelvis, and thence continued on to the abdominal parietes. This is the transversalis fascia and its prolongations, iliac and pelvic; it extends from the diaphragm to the floor of the pelvis, forming in its course sheaths of the psoas and iliacus muscles, and from the sides of the lumbar spine to the linea alba.

Whilst perimetric inflammations are usually limited to the pelvis and its immediate neighbourhood, parametric inflammations often extend in the abdominal parietes as high as the umbilicus, or into the sheath of the psoas, forming a psoas abscess, which only differs from the usual form in an absence of caries, and in its consequent tendency to close rapidly after complete evacuation.

The cellular tissue, which is microscopic over the fundus uteri, exists in considerable abundance in the lower part of the broad ligaments between the cervix and pelvic wall, also in front between it and the pubis, and these are the three chief parametric regions in the pelvis. Above the pelvis the iliac fossæ, psoas sheaths, and probably the lumbar region behind or about the kidneys, are the seats of remote inflammation.

Douglas's pouch and the fossæ on either side of the uterus in front of the broad ligaments are the principal perimetric regions.

These inflammations have the same pathological character as in other situations:—Adhesive pleurisy, pleurisy with effusion of serum or pus; adhesive perimetritis, serous or purulent perimetritis:—Inflammation of cellular tissue without the formation of pus, *i.e.*, phlegmon, or with abscess; parametric phlegmon or abscess.

The effect of these inflammations is the formation of a tumour, which may vary in size according to the position and extent of the disease. If it fills the peritoneal cavity of the pelvis and extends into the hypogastrium, it may be as large as a fœtal head at full term, or larger; if it occupies Douglas's pouch only, it may be the size of a hen's egg; if it is limited to the structures forming the roof of the pelvis at the level of the cervix uteri, it may be an induration of a few lines in thickness only, but of considerable extent; if it be limited to one broad ligament, it may be the size of a pigeon's egg; if it occupies the sheath of the psoas muscle, it may extend into the thigh, and contain from one to two pints of pus.

The effect of the tumour is pressure and consequent displacement of neighbouring structures. A tumour in Douglas's pouch displaces the uterus forwards and upwards; a tumour in a broad ligament displaces the uterus laterally, unless in either case the

uterus is already fixed by induration before the formation of the tumour; so that in the description of vaginal examinations, the uterus is described as fixed by induration on one side or another, or entirely surrounded by it, and either in its natural situation or displaced upwards, backwards, forwards, or laterally.

The examination of the abdomen is usually described as the finding of tenderness with increased resistance, or a tumour situated in the hypogastric or in the iliac region.

In the notes of cases, the vaginal examination is abbreviated from Dr. Duncan's notes given at the bedside or in the theatre.

A woman in the child-bearing period of life enters the room, leaning on the arm of a friend; she is pale and sallow, her cheeks slightly flushed, and her countenance expressive of pain and anxiety. She walks lame and with difficulty.

She says that she was confined a month ago, her labour being normal, and she progressed favourably until ten days after, when she got up and began to resume her work. Three or four days after getting up, she was attacked with pain in the hypogastrium and thigh, and had a rigor. She lost her appetite, suckled her baby and worked as long as she was able to. She had feverish, restless nights, and lately the pain has increased.

Her pulse is 120; temp. 101.4°. The secretion of milk is much diminished in quantity. Urine rather below the average, sp. gr. about 1015, otherwise normal.

This woman is suffering from parametritis or perimetritis.

On examination, the abdomen is found to be somewhat distended, tender to pressure, especially to deep pressure in one or both iliac regions. Douglas's pouch is found to be occupied by a *convex* exceedingly *tender hardness*, which fixes the uterus and displaces it forwards towards the symphysis pubis.

This woman is suffering from perimetritis, the chief part affected being Douglas's pouch.

Or the abdomen is generally somewhat tender; the abdominal wall for three inches immediately above the left Poupart's ligament is *elevated*, red on the surface, very tender and indurated, the upper margin of the induration being well defined, so that the tips of the fingers can easily be pressed underneath it from above. By a vaginal examination there is found a hard tender swelling to the left of the cervix uteri, which displaces the uterus somewhat to the right, and fixes it firmly in that position; the finger cannot be passed between the swelling and the pelvic wall, for they are continuous.

This woman is suffering from an inflammation in the region of the left broad ligament and the cellular tissue which is continuous with it and the abdominal wall:—Parametritis.

Such are some of the leading features of the cases which present themselves frequently in the out-patient room or are admitted to Martha.

I will shortly describe the three forms of perimetritis.

1. *Adhesive perimetritis.*—In the slightest cases the uterus is glued to the sacrum, and Douglas's pouch as a cavity ceases to exist. All symptoms of the adhesion having taken place may be absent until some secondary symptom arises.

On examination, the uterus is found to be fixed to the sacrum, usually the left side, and possibly retroflected, any attempt to reduce which would cause great pain and be unsuccessful.

Unless the adhesions are very firm, the uterus will gradually regain its mobility by the absorption or breaking down of the adhesions, which is brought about by the frequent slight movements of these parts. There is no treatment for this form; if the adhesions do not disappear spontaneously, it will be unwise to attempt to free them by force; rest in bed is essential.

In another case it may be that an inflamed ovary falling back into Douglas's pouch sets up inflammation immediately around it; and on examination, all that is found is a small, round, very tender tumour, occupying one-half of Douglas's space. I have watched a case throughout in which at first two tender ovaries were to be felt in Douglas's space; a week later the whole of Douglas's space was occupied by very tender perimetric inflammation. After treatment the inflammation subsided and the ovaries were to be again felt; last of all, they apparently regained their natural position, and disappeared from reach.

2. *Serous Perimetritis.*—In a more extensive case, all the peritoneal tract which I have before described is inflamed; the pelvic peritoneum is lined with lymph; some fluid is poured out; the surfaces of the intestines covering the pelvic cavity are also inflamed, and glued together and covered with lymph; and then a sort of tumour of intestines and omentum matted together is formed, extending from behind the uterus perhaps to the umbilicus, or into the hypogastric region, when it feels like a solid tender tumour, but which is found to be semi-resonant on percussion.

The attack is ushered in with all the symptoms of perimetritis—pain, fever, especially at night, sickness, thirst, loss of appetite, constipation, diminished secretion of urine; all the symptoms being of a subacute rather than acute character, and all disappearing very readily under the simplest treatment. Absolute rest in bed, poultices to the abdomen, vaginal douches every

night of warm water, warm baths twice a week, milk diet, and the relief of constipation.

Ten days or a fortnight of such treatment and the tumour is gone from the abdomen ; the convex tender swelling in Douglas's space becomes concave and the tenderness disappears, and in six weeks nothing may be left but some induration behind the uterus. Such was the case, the notes of which follow:—

### *Perimetritis Simplex.*

M. A. T., aged 23 ; admitted January 25, 1878 ; discharged March 1. Married four years ; two children, last a month ago ; in labour thirty-six hours; immediately after was attacked with rigors and cramps in the legs and pain in the left iliac region ; vomiting and diarrhœa. These symptoms gradually passed away, but at the end of a fortnight, on getting up, they returned.

She is pale and anæmic ; no appetite ; vomits two or three times a day ; urine normal.

Temperature, morning 98.4°, evening 101.4° ; pulse, 96.

She complains of severe aching pain across the lower part of the abdomen and back and down the front of the left thigh.

The lower part of the belly, from one iliac spine to the other, extending to within two inches of the umbilicus, is occupied by a tender hardness which is semi-resonant.

*Per vaginam.*—The whole brim of pelvis is occupied by dense, tender hardness, which projects into Douglas's pouch. Uterus displaced forwards ; it is three and a half inches in length, firmly fixed.

Feb. 2 (eight days).—Abdominal tumour much diminished in size, especially on the right side. Temp. morning, 98.8°, evening 101.6°.

Feb. 7 (thirteen days).—Tender hardness in roof of pelvis much diminished ; uterus somewhat moveable. Much less pain.

Feb. 19 (twenty-five days).—Tender hardness nearly disappeared.

March 1 (thirty-five days).—Uterus freely moveable ; no tenderness or induration to be felt either per vaginam or in the hypogastrium.

There is a rare form of this variety which can only take place under exceptional circumstances ; it is called by Dr. Duncan " encysted serous perimetritis." This occurs when the inflammatory adhesions precede the effusion of serum and form a kind of cyst-wall strong enough to stand the pressure of the enclosed fluid.

Douglas's pouch usually forms part, and often the greater part, of the cyst, and the roof may be sufficiently strong to stand a pressure which is sufficient to cause distension of the perineum.

These are the notes of a case:—

*Encysted Serous Perimetritis.*

C. B., aged 25; admitted April 24, 1878; discharged May 10. Married four years; one child four months ago, delivered with forceps, alive.

Suffered from puerperal convulsions and was insensible for three weeks after birth of child.

Two months ago first felt pain in hypogastrium accompanied with rigors and profuse perspirations.

The pain is now more severe and of a cutting character; micturition painful and difficult; bowels not open for a week. Temp. morning 100.6°, evening 101.6°.

The lower part of the belly is occupied by a hardness, somewhat tender, nearly of the shape and size of a four months' gravid uterus, but not of the same feeling. It is comparatively dull on percussion.

*Per vaginam.*—The pelvis is occupied by an elastic mass, which is globular; the cervix uteri is with difficulty reached by passing the finger between the mass and the symphysis; it lies high above the pubes. The uterus is natural in size, and the fundus lies about four inches above the pubes. It is deflected to the right side.

The swelling was opened per vaginam and three-quarters of a pint of turbid, serous, non-purulent fluid evacuated.

April 26 (first day).—Patient feels much relieved; her pain is less. Temp. 99.8°; afterwards normal.

May 4 (nine days).—No pain or discharge; abdomen natural. Behind the uterus there remains some not very dense induration.

The cyst in this case distended Douglas's pouch so as nearly to fill the pelvis, forcing the uterus up above the pubes, and distending the perineum.

All the symptoms rapidly subsided after puncture with the knife, which was the right treatment, but only to be done when the diagnosis is certain, and with care, as it would not take much force to break down some adhesions, and so set up a communication with the whole peritoneal cavity, and probably septic peritonitis.

The third form, *purulent perimetritis*, is one of the forms of pelvic abscess, and is much like the last variety, the symptoms

being more severe. The tumour is more frequently formed above the uterus, and consists of numerous spaces between the intestines lined with pyogenic membrane and filled with pus.

These cavities usually evacuate themselves into the intestines, or bladder, or both. A patient in Martha frequently passed flatus with micturition after an abscess of this kind. The bursting of the abscess into the bladder or rectum is known by the relief of symptoms and the discharge of a large quantity of pus with micturition or stool. Convalescence in these more severe cases is very slow, and it may be many months before the fistulous track closes.

The treatment in all these cases is absolute rest in bed, with poultices, warm baths and douches, light diet and purgatives.

I have notes of 38 cases. They appear to be nearly equally distributed throughout the year. The youngest was eighteen, the oldest forty-nine. All with one exception were married, and in the one case evidence was wanting of her being a virgin. Twenty-eight had borne children or miscarried; 9 had never been pregnant; 25 suffered from the disease in the first ten years of married life, 8 in the second, 2 in the third.

In 14 cases it followed confinement or abortion, which are the chief predisposing causes of these diseases; and it appears that exposure to cold and a too early return to household duties were the principal exciting causes in these cases.

In the list of assigned causes there are examples of most of the other causes given in books, some of which ought particularly to be mentioned.

The presence of uterine fibroids may excite inflammation in the same way as ovarian cysts do, whatever that may be.

Extension of inflammation of the ovaries.

The effect of injuries of the uterus, such as incision of the cervix, passage of uterine probe, the application of a caustic. In the one case noted here, it was due to the application of a zinc alum point to the cervix for cervical catarrh, the patient having previously suffered from the same complaint.

As a complication of cancer of the uterus, local peritonitis has been long recognised. In extensive disease it might be impossible to recognise it, unless, as in the case in Martha, it was of the purulent form and discharging into the rectum. In one case of which I have notes, a patient was admitted with perimetritis, for which no cause could be ascertained; she had never been pregnant. Eight months later she was readmitted with extensive cancerous disease of the uterus.

Of the forms of perimetritis, 1 was adhesive, 31 serous, 1 encysted serous, 5 purulent.

Thirty-six out of 38 cases left the Hospital well; of the remaining 2, one was chronic, the other complicated cancer of the uterus.

Thirty-two terminated by resolution, 5 were evacuated spontaneously by the rectum, and 1 was punctured per vaginam.

In 30 cases the chief seat of the disease was Douglas's pouch; and here there may be sometimes difficulty in diagnosis between perimetritis and a perimetric effusion of blood, as in hæmatocele.

In ordinary cases of hæmatocele there is no rise of temperature, and the tumour increases at the menstrual period, decreasing afterwards. The history of the cases also should give us a clue.

## PARAMETRITIS.

Phlegmon is the common form of parametritis, though abscess is hardly less frequent. By a phlegmon is meant an inflammation of cellular tissue, with effusion of serum into it, producing pain, heat, swelling, and, where visible, redness of the part; all these subsiding without the formation of an abscess. The tender red induration round a boil is commonly given as an example of this condition.

I have mentioned before that the chief parametric regions are on either side of the uterus and in front of it, where the cellular tissue is abundant, and that the walls of the pelvis, the abdominal parietes, and the psoas and iliacus sheaths are continuous with this tissue, and so inflammation may easily spread to these parts,—the situation giving a distinguishing name to the form of the disease. Simple parametritis, affecting any of the principal parametric regions; parametritis transversalis, affecting the abdominal parietes; parametritis inguinalis, affecting the inguinal region; psoas parametritis, affecting the sheath of the psoas.

The symptoms of parametritis are similar, but, if anything, rather less acute than in perimetritis, unless suppuration takes place; and it would be impossible to make a diagnosis without a careful examination of the abdomen and usually of the vagina.

These are the notes of a case of parametritis simplex:—

### *Parametritis Simplex.*

C. H., aged 23; admitted June 10, 1879; discharged June 28. Married twelve months. Was confined on May 9 (a month ago); labour natural, but immediately after she was attacked with severe pain in the right iliac region and the thigh, and with rigors. She has not regained her strength, and on attempting to walk the pain returns.

She has little pain now when lying in bed, but is very sallow and anæmic. Urine normal. Pulse 96; temp. 99°.

Abdomen natural, but deep palpation over the brim of the pelvis on the right side discovers resistance and some tenderness.

*Per vaginam.*—Uterus somewhat displaced to the left; cervix fixed nearly in the middle of hardness, which is scarcely tender; on the right side the hardness is continuous with the right ischial plane.

21st (eleven days).—Hardness everywhere diminished and uterus somewhat displaced to the left.

28th (eighteen days).—No hardness; uterus freely moveable in natural situation.

This was a case of parametric phlegmon, involving the right broad ligament and wall of pelvis, displacing the uterus to the left and fixing it there. The note says that the hardness to the left of the uterus was continuous with the left ischial plane or wall of pelvis. This is an important diagnostic sign between peri- and para-metritis, for in perimetritis the hardness extends almost to the wall of the pelvis and then upwards, so that the finger can pass between the two; but in parametritis, the structures being continuous, the finger cannot pass between them.

Resolution took place by arrest of the inflammation, absorption of the effused materials, and contraction of the inflamed area, the uterus at first being drawn to the right side, then regaining its natural position, and the patient left the Hospital well in eighteen days.

### *Parametritis Inguinalis.*

R. B., aged 22; admitted May 3, 1879; discharged June 7, thirty-three days. Married two years; two children, last eight weeks ago. Six weeks ago, after leaving the Lying-in Hospital, where she had suffered from a labial abscess after her confinement, she was seized with rigors and vomiting, and pain in the right iliac region and thigh.

She noticed a swelling in the right groin three days after, ten days ago; no vaginal discharge. There is an elastic hardness, slightly prominent and very tender, extending along Poupart's ligament on the right side, two inches in width. Right thigh contracted to a right angle.

*Per vaginam.*—Cervix uteri in natural situation; pressing deeply in the right side of the pelvis, tender hardness meets the finger, in which fluctuation is distinct.

12th (nine days).—Abscess pointed in centre of Poupart's ligament and opened; pus not fœtid.

15th (twelve days).—General condition much improved; swelling and hardness subsiding.

22d (nineteen days).—Abscess closed; tenderness and hardness in vagina have disappeared. Can extend the right thigh completely.

This form leads us to the varieties of remote parametritis; that is to say, the inflammation which has commenced in the central parametric area, has extended to a more distant part, such as the abdominal wall or psoas muscle, and there terminates by the formation of an abscess, the primary inflammation having disappeared.

Cases have been described by Dr. Duncan in which he has followed the course throughout. As a rule, the early symptoms are slight, and patients do not present themselves until an abscess is forming. In this case the disease may have begun in the right parametric region, extended to the right iliac fossa, where an abscess formed and pointed at the usual spot, just above the centre of Poupart's ligament. The table accompanying this case shows a marked night rise and morning fall, which appear to be characteristic of peri- and para-metritis.

Temperature Table.

| | A.M. | P.M. |
|---|---|---|
| May 3 | 99.4 | 99.6 |
| „ 4 | 101.0 | 101.2 |
| „ 5 | 99.8 | 102.0 |
| „ 6 | 100.2 | 103.0 |
| „ 7 | 99.0 | 103.4 |
| „ 8 | 99.2 | 101.4 |
| „ 9 | 101.4 | 100.2 |
| „ 10 | 102.0 | 102.2 |
| „ 11 | 103.8 | 103.2 |
| „ 12 | 101.8 | 99.6 (evacuation of pus). |
| „ 13 | 99.8 | 99.8 |
| „ 14 | 99.8 | 99.8 |
| „ 15 | 97.0 | 97.2 |
| „ 16 | 97.0 | 98.0 |

After this date the temperature was normal.

*Parametritis Transversalis.*

L. S., aged 47, admitted March 24, 1879; discharged May 13, fifty days. Married twenty years; twelve children, last three months ago. About a month after her confinement, on resuming her ordinary occupation, she was seized with pain in the left inguinal region; rigors and vomiting; she has lost her appetite, and is feverish, especially towards night.

A swelling formed in the lower part of the abdomen on the left side, which broke three days ago and discharged pus.

She lies with the left leg slightly flexed. Belly considerably swollen.

There is a tender swelling, eight inches in width, commencing at mesial line above symphysis, and extending along Poupart's ligament to two inches above the left superior spine of the ilium.

This hardness projects nearly at a right angle to brim of pelvis. It is not absolutely dull on percussion.

There is an opening discharging pus a little above the left spine.

*Per vaginam.*—Nothing abnormal discovered.

April 8th (eleven days).—Good progress until to-day; more pain and hardness in old position.

11th (fourteen days).—Abscess pointing over centre of Poupart's ligament (opened).

25th (twenty-eight days).—All hardness gone; abscess closed; leg still flexed and stiff.

May 13th (fifty days).—Discharged well.

In this case an abscess formed in the abdominal wall, and at the time of admission no inflammation in the immediate neighbourhood of the uterus was found.

Dr. Duncan has called these cases "parametritis transversalis" because he believes them to be formed in connection with the transversalis fascia and muscle. They are sufficiently characteristic when seen, and in well-marked cases form a tender tumour, with so definite an outline and boundaries that they have been mistaken for large uterine fibroids, whereas they are entirely confined to the abdominal wall; and where the parietes are fat and loose, the fingers can be passed behind and underneath the margins of the tumour, which is extremely hard.

All the cases of remote parametritis I have seen have occurred at a considerable period after the exciting cause, such as abortion; not three or four weeks, but two or three months after. This is rather in favour of the extension by continuity theory than that the inflammatory attack commenced in this situation.

The next case I shall describe more at length, as it is the only one in which this disease proved fatal. One other case died. She was admitted under Dr. Andrew's care suffering from chronic pyæmia. She was three months pregnant and aborted in the Hospital; parametric abscesses rapidly formed, and she died of pyæmia.

*Psoas Parametritis.*

A. C., aged 35; admitted July 5, 1879, died August 2. Married three years; one child two years ago; one miscarriage

at two months, May 6th (two months ago). Had always enjoyed good health until then.

She kept her bed a fortnight, and a fortnight later was seized with pain in the lumbar region and right iliac region, accompanied with rigors. She has not been able to walk since; the pain has gradually increased, and the thigh became flexed.

She is somewhat emaciated; appetite bad. No history of phthisis; her lungs and other organs are healthy. She lies on her back, with the right thigh drawn up to an angle of 70°. No sign of spinal disease discovered.

On pressure, a tense, tender, elastic swelling can be felt in the direction of the right psoas muscle, extending from above the centre of Poupart's ligament to above the iliac crest.

17th (twelve days).—Thigh flexed to a right angle; the swelling is more apparent.

22d.—The swelling and tenderness is disappearing from the iliac region, and is extending beneath Poupart's ligament into the thigh.

30th.—General condition not so good; does not take her food; sleeps only with morphia.

An opening was made into the most prominent part of the abscess, about three inches below Poupart's ligament; a large quantity of healthy not fœtid pus evacuated, with some relief.

31st.—General slight peritonitis; abdomen tympanitic and tender; rigors and sickness. Bowels obstinately confined. Pulse 142; temp. 102°.

August 1.—Vomiting continues fœcal. Bowels open after an enema. Pulse too small and frequent to count. Temp. 102°.

2d.—Died this morning.

*Post-mortem twelve hours after death.*—Body emaciated. Abdomen distended. Slight general peritonitis.

In the cæcal region the intestines are matted together and very rotten. They are adherent to the wall of a large abscess which is contained in the greatly distended and thickened sheath of the psoas muscle.

The abscess extends beneath Poupart's ligament into the thigh, where it forms a cavity between the muscles, which would hold about half-a pint; that in the abdomen, a pint.

The wall of the abscess internally is everywhere smooth, and is unconnected with bone. The nerves of the lumbar plexus passing through the cavity are cleanly dissected out, and appear uninjured.

The intestines are adherent to the abscess wall in three places, viz., about four inches above the anus, where there is a large ulcerated patch, the cæcum is also adherent, and the ilium

about two feet above the cæcum, at which place the canal of the intestine is nearly obliterated.

Heart and lungs healthy. Kidneys and liver fatty.

This is the most serious form of parametritis from its extent, though it does not present the same dangers as a psoas abscess dependent on caries. We need have no hesitation in opening it freely as soon as it becomes sufficiently superficial. Once emptied, the cavity will contract, and no further formation of pus should take place, especially if this is carried out antiseptically. I have notes of two cases; one recovered rapidly in this way, her total stay in the Hospital being about nine weeks; the other, the notes of which are given above, rapidly succumbed to the effects of the disease three days after the opening of the abscess.

The post-mortem showed how nature would have dealt with the abscess if we had let it alone and she had survived; it would have opened almost simultaneously in the thigh, rectum, cæcum, and ilium; but the adhesive peritonitis which had taken place to effect this had aided the fatal result by almost obliterating the intestinal canal at one part.

This manner of evacuation by two or three openings into the intestines is common to parametric and perimetric abscesses, though it very rarely takes place in ordinary psoas abscess.

I have notes of twenty-seven cases of parametritis; nearly half of them were admitted during the summer of 1879, when there seems to have been a greater tendency than usual to both para- and peri-metritis; and as the majority were due to exposure following parturition or abortion, the long-continued cold and wet weather may have been partly responsible for the epidemic.

The age of the patients is almost the same as in the perimetric cases, 18–47; thirteen cases occurring between the ages of 20 and 30, nine between 30 and 40.

In nearly every case the patient was married; four were single, but had borne children or miscarried; two of the married women had never been pregnant; in one of these the cause was traumatic, the disease following incision of the cervix for dysmenorrhœa; the other appeared to be idiopathic. The immediate cause in sixteen cases was exposure after parturition; in eight, exposure after abortion. One case followed exposure during menstruation; in one the cause was traumatic, in another no cause could be assigned.

Fourteen cases were phlegmonous, and terminated by resolution; the remaining thirteen were purulent, and evacuated themselves spontaneously or were evacuated by the knife.

Twenty-five recovered, two died.

*Date of Admission.*

| | Perimetritis. | Parametritis. | | Perimetritis. | Parametritis. |
|---|---|---|---|---|---|
| 1877. | | | 1878. | | |
| November | 3 | 1 | October | 1 | 1 |
| December | 2 | 2 | November | 2 | ... |
| 1878. | | | December | 2 | 1 |
| January | 5 | ... | 1879. | | |
| February | 2 | 1 | January | 1 | ... |
| March | ... | 3 | February | 2 | ... |
| April | 2 | ... | March | 1 | 1 |
| May | 2 | 2 | April | 2 | 3 |
| June | ... | 1 | May | ... | 3 |
| July | 1 | 1 | June | 2 | 3 |
| August | 1 | ... | July | 6 | 2 |
| September | ... | 1 | August | 1 | 1 |
| | | | Total | 38 | 27 |

*Ages.*

| | Perimetritis. | Parametritis. |
|---|---|---|
| Under 20 | 1 | 3 |
| ,, 20–30 | 25 | 13 |
| ,, 30–40 | 9 | 9 |
| ,, 40–50 | 3 | 2 |
| Total | 38 | 27 |

*Married or Single.*

| | Perimetritis. | Parametritis. |
|---|---|---|
| Married | 37 | 23 |
| Single | 1[1] | 4[2] |
| Total | 38 | 27 |

*Pregnant or Unpregnant.*

| | Perimetritis. | Parametritis. |
|---|---|---|
| Been pregnant | 28 | 25 |
| Never pregnant | 9 | 2 |
| Uncertain | 1 | ... |
| Total | 38 | 27 |

*How long Married.*

| | Perimetritis. | Parametritis. | | Perimetritis. | Parametritis. |
|---|---|---|---|---|---|
| 1 month | 1 | ... | 11 years | 2 | 1 |
| 6 months | 1 | ... | 12 ,, | 1 | ... |
| 1 year | ... | 4 | 13 ,, | 1 | 1 |
| 2 ,, | 2 | 1 | 14 ,, | 1 | ... |
| 3 ,, | 6 | 3 | 15 ,, | ... | 2 |
| 4 ,, | 4 | 1 | 19 ,, | 1 | ... |
| 5 ,, | 2 | 1 | 20 ,, | 2 | 1 |
| 6 ,, | 3 | 1 | 22 ,, | 1 | ... |
| 8 ,, | 2 | ... | 30 ,, | 1 | ... |
| 9 ,, | 3 | 2 | Unknown | 2 | 4 |
| 10 ,, | 1 | 1 | | | |
| | | | Total | 37 | 23 |

[1] Absence of hymen.

[2] All had been pregnant.

## *Assigned Cause.*

| | *Perimetritis.* | *Parametritis.* |
|---|---|---|
| Exposure post-partum | 8 | 16 |
| ,, ,, abortionem | 6 | 8 |
| ,, during menstruation | 2 | 1 |
| Traumatic | 1 | 1 |
| Ovaritis | 2 | ... |
| Ovaritis and gonorrhœa | 1 | ... |
| Inflamed fibroid? | 2 | ... |
| Endometritis? | 1 | ... |
| Preceding cancer of uterus | 1 | ... |
| Complicating ,, ,, | 1 | ... |
| No cause assigned | 5 | ... |
| None known | 6 | 1 |
| Following typhoid | 2 | ... |
| | 38 | 27 |

## *Form.*

| *Perimetritis.* | | *Parametritis.* | |
|---|---|---|---|
| Adhesive | 1 | Phlegmon | 14 |
| Serous | 31 | Abscess | 13 |
| Encysted serous | 1 | | 72 |
| Purulent | 5 | | |
| | 38 | | |

## *Situation.*

| *Perimetritis.* | | *Parametritis.* | |
|---|---|---|---|
| Filling Douglas's pouch | 23 | Right parametric region | 3 |
| Right half ,, | 4 | Left ,, ,, | 9 |
| Left ,, ,, | 3 | Both parametric regions | 5 |
| Round and above uterus | 7 | Right side in front | 2 |
| Left side in front of uterus | 1 | Inguinalis | 3 |
| | 38 | Transversalis | 3 |
| | | Psoas | 2 |
| | | | 27 |

## *Results.*

| | *Perimetritis.* | *Parametritis.* |
|---|---|---|
| Resolution | 32 | 14 |
| Opened by knife | ... | 9 |
| By puncture per vaginam | 1 | ... |
| Evacuated by bowels | 5 | ... |
| Evacuated by bladder | ... | 1 |
| Evacuated by bladder and rectum | ... | 1 |
| Recovered | 38 | 25 |
| Died | | 2 |
| | | 27 |

## Thirty-Eight Cases of Perimetritis.

| Name, Age, Married, or Single. | Date of Admission. | Date of Discharge. | Births, and date of last. | Miscarriages, and date of last. |
|---|---|---|---|---|
| | 1877. | | | |
| *M. A. H., 28, m. 9 years . | Nov. 7 | Dec. 16 | ... | ... |
| C. P., 26, m. 9 years . | Nov. 10 | Dec. 27 | 3, 4 years | 3, 3½ months |
| E. W., 23, m. 2 years . | Nov. 29 | Dec. 20 | ... | ... |
| E. M., 26, m. 5 years . | Dec. 4 | Jan. 4 | ... | ... |
| E. R., 26, m. 8 years . | Dec. 19 | Jan. 17 | 1, 7 years | ... |
| | 1878. | | | |
| J. C., 32, m. 13 years . | Jan. 13 | ... | 5, 3 years | 3, 18 months |
| E. C., 49, m. 30 years . | Jan. 25 | Feb. 8 | 1, 29 years | 1, 15 years |
| M. A. T., 23, m. 4 years . | Jan. 25 | March 1 | 2, 1 month | 1, 13 months |
| R. R., 28, m. 3½ years . | Jan. 25 | Feb. 11 | 2, 13 months | ... |
| S. J., 20, m. 6 months . | Jan. 26 | Feb. 12 | ... | ... |
| M. B., 39, m. 19 years . | Feb. 2 | March 1 | 1, 18 years | ... |
| J. H., 29, m. 5 years . | Feb. 12 | March 8 | ... | ... |
| L. M., 18, m. . . | April 21 | May 12 | 1, 8 weeks | ... |
| C. B., 25, m. 4 years . | April 24 | May 10 | 1, 4 months | ... |
| E. B., 30, m. 3 years . | May 28 | July 12 | 1, 18 months | 1, 5 months |
| E. W., 23, m. 1 month . | May 31 | June 25 | ... | ... |
| S. T., 20, m. . . | July 17 | Aug. 6 | ... | ... |
| *M. A. H., 28, m. 10 years . | Aug. 28 | Oct. 6 | ... | ... |
| G. E., 34, m. 4 years . . | Oct. 1 | Nov. 8 | 2, 1 year | ... |
| R. C., 28, m. 6 years. | Nov. 6 | Nov. 29 | 1, 4 years | 2, 3 months |
| C. F., 23, m. 3 years . . | Nov. 28 | Dec. 17 | 1, 18 months | ... |
| A. E. C., 24, m. 3 years . | Dec. 12 | Jan. 10 | 1, 12 months | 1, 5 months |
| E. C., 40, m. 20 years . | Dec. 30 | Jan. 21 | 10, 10 months | 6 |
| | 1879. | | | |
| E. M., 31, m. 11 years . | Jan. 25 | Feb. 13 | 5, 2 years | 1, 7 years |
| J. S., 25, m. 8 years . . | Feb. 3 | Feb. 26 | 1 | 1, 10 days |

PERIMETRITIS CASES—*continued.*

| Seat of Disease. | Result. | Assigned Cause. | Remarks. |
|---|---|---|---|
| Behind uterus | Resolution | None | Chronic; in Hospital twice before.* |
| Left side behind uterus | Do. | Exposure, ovaritis | ... |
| Round and above uterus | Do. | None | Commenced 2 days after cessation of catamenia. |
| Right side behind uterus | Do. | None | Readmitted 2 months later with carcinoma-uteri. |
| Right side behind uterus | Do. | None | 2 days after catamenia. |
| Behind uterus | Do. | Exposure during catamenia | Sanguineous discharge one early symptom. |
| Behind uterus | Do. | Inflamed fibroid | ... |
| Above uterus, nearly to umbilicus and both iliac regions | Do. | Exposure after confinement | An extensive semi-resonant tumour. |
| Behind uterus | Do. | Ovaritis (gonorrhœal) | ... |
| Round uterus | Do. | Exposure during catamenia | Uterine fibroid present. |
| Behind uterus | Do. | Ovaritis | ... |
| Round uterus | Do. | Inflamed fibroid | 4 days after catamenia. |
| Round uterus | Do. | Exposure after confinement | ... |
| Behind uterus | Punctured per vaginam | Eclampsia post-partum | Encysted serous; $3\frac{3}{4}$ pints of serous turbid non-purulent fluid evacuated. |
| Behind uterus | Resolution | ... | ... |
| Behind uterus | Do. | Ovaritis | ... |
| Behind uterus | Do. | ... | Bad health since typhoid, 14 months previously. |
| Behind uterus | Do. | ... | Zinc alum point introduced to cervix for cervical catarrh.* |
| Abscess behind uterus | Evacuated per rectum | ... | Uterus found fixed to sacrum 6 months after. |
| Left side in front of uterus | Resolution | Exposure after abortion | Relapse 6 weeks after. |
| Left side behind uterus | Do. | ... | Preceded by deferred catamenia, which lasted 10 days; uterus left fixed to sacrum. |
| Behind uterus | Do. | Exposure after abortion | ... |
| Behind uterus | Do. | ... | Following cessation of catamenia. |
| Behind uterus | Do. | ... | Debility since typhoid, 5 months previously. |
| Abscess behind uterus | Evacuated per rectum | Exposure after abortion | ... |

PERIMETRITIS CASES—*continued.*

| Name, Age, Married or Single. | Date of Admission. | Date of Discharge. | Births, and date of last. | Miscarriages, and date of last. |
|---|---|---|---|---|
| | 1879. | | | |
| M. B., 20, m. 2 years . | Feb. 8 | April 1 | 1 | ... |
| E. F., 22, m. 3 years . | Mar. 29 | April 19 | 2, 9 weeks | ... |
| F. C.. 29, m. 11 years . | April 16 | May 16 | ... | 1, 10 years |
| J. T., 26, m. 6 years . | April 28 | May 25 | 2, 9 weeks | ... |
| L. D., 37, m. 14 years . | June 2 | June 14 | 2 | ... |
| R. S., 34, m. 12 years . | June 7 | June 15 | 2, 16 years | ... |
| E. W., 41, m. 22 years . | July 7 | July 27 | 7, 15 months | 1, 1 month |
| E. N., 39, m. 9 years . | July 1 | July 11 | ... | ... |
| J. W., 37, m. 20 years . | July 3 | July 31 | 2, 14 years | 2, 16 years |
| E. W., 23, m. 3 years . | July 14 | July 31 | 2, 6 weeks | ... |
| S. A., 28, s. . . . | July 21 | Aug. 29 | ... | ... |
| J. A., 24, m. 4 years . | July 24 | Aug. 20 | 2, 18 months | ... |
| E. S., 27, m. 6 years . | Aug. 13 | Sept. 26 | 2 | 2, 1 month |

TWENTY-SEVEN CASES OF PARAMETRITIS.

| Name, Age, Married or Single. | Date of Admission. | Date of Discharge. | Births, and date of last. | Miscarriages, and date of last. |
|---|---|---|---|---|
| | 1877. | 1878. | | |
| A. M., 27, m. 1½ years | Nov. 20 | Jan. 8 | 1, 5 months | ... |
| T. C., 30, m. 11 years | Dec. 1 | Jan. 17 | 6, 1 month | 2, 1 year before |
| S. S., 25, m. 4 years | Dec. 11 | Jan. 7 | 3, 1 month | ... |
| | 1878. | | | |
| A. W., 23, m. 3 years | Feb. 13 | April 2 | 2, 1 month | ... |
| M. A. T., 38, m. | March 27 | April 9 | ... | ... |
| G. S., 33, m. 15 years | March 27 | April 13 | 6, 2 weeks | 4 |
| M. A. S., 18, m. 1 year | March 20 | April 21 | 1, 6 weeks | ... |
| S. W., 35, m. 15 years | May 22 | June 30 | 4, 2 months | ... |
| R. L., 24, m. 3 years | May 28 | June 11 | 2, 5 months | ... |
| R. S., 27, m. 6 years | June 17 | August 13 | 4, 6 months | ... |
| E. G., 35, m. 13 years | July 10 | August 6 | 5, 15 months | 1, 1 month |
| S. A., 38, m. | Sept. 22 | Oct. 18 | 7, 7 years | 5, 2 months |
| M. L., 26, m. | Oct. 2 | Oct. 19 | 2, 3 months | ... |

PERIMETRITIS CASES—*continued.*

| Seat of Disease. | Result. | Assigned Cause. | Remarks. |
|---|---|---|---|
| Right side behind uterus | Resolution | None known | Uterus left fixed to sacrum. |
| Left side behind uterus | Do. | Exposure after confinement | |
| Behind uterus | Do. | None known | |
| Right side behind uterus | Do. | Exposure after confinement | |
| Uterus fixed to sacrum | Do. | Do. | Adhesive perimetritis. |
| Round uterus | Do. | Following endometritis | |
| Behind uterus | Do. | Abortion | |
| Abscess behind uterus | Evacuation per rectum | Complicating cancer | |
| Round uterus | Resolution | None known | |
| Abscess behind uterus | Evacuated per rectum | Parturition | |
| Abscess behind uterus | Do. | None known. | Absence of hymen. |
| Behind uterus | Resolution | None known | Widow. |
| Behind uterus | Do. | Abortion | Uterus left fixed to sacrum. |

PARAMETRITIS CASES—*continued.*

| Seat of Disease. | Result. | Assigned Cause. | Remarks. |
|---|---|---|---|
| Left of uterus | Resolution | Exposure after confinement | |
| P. inguinalis | Opened in right groin | Do. | |
| Do. | Do. | Do. | |
| Left of uterus | Opened in left groin | Do. | |
| Do. | Resolution | Traumatic | 24 hours after incision of cervix for dysmenorrhœa. |
| Both sides | Do. | Exposure after confinement | A slight case. |
| Do. | Do. | Do. | |
| P. transversalis | Opened by knife | Do. | |
| Left of uterus | Resolution | Do. | |
| Right of uterus | Opened into bladder | Do. | |
| Left of uterus | Resolution | Exposure after abortion. | |
| Do. | Do. | Do. | |
| Right and front of uterus | Do. | Exposure after confinement | |

PARAMETRITIS CASES—*continued.*

| Name, age, Married or Single. | Date of Admission. | Date of Discharge. | Births, and date of last. | Miscarriages, and date of last. |
|---|---|---|---|---|
| | 1878. | | | |
| M. A. H., 33, s. | Dec. 10 | Feb. 14 | ... | 1, 6 weeks |
| | 1879. | | | |
| L. S., 47, m. 20 years | March 24 | May 13 | 12, 3 months | |
| S. B., 18, s. | April 9 | May 23 | ... | 1, 2 days |
| L. M. C., 18, m. 1 year | April 21 | April 29 | 1, 8 weeks | |
| H. D., 24, s. | April 22 | May 16 | ... | 1, 3 years |
| R. B., 22, m. 2 years | May 3 | June 7 | 2, 8 weeks | ... |
| J. F., 24, m. | May 15 | Died May 18 | ... | 1, 3 weeks |
| E. B., 21, m. 9 years | May 17 | July 5 | 6, 9 weeks | ... |
| C. H., 23, m. 1 year | June 10 | June 28 | 1, 4 weeks | ... |
| A. M., 23, s. | June 12 | July 17 | 1, 6 years | 1, day of adms. |
| J. W., 35, m. 5 years | June 25 | July 22 | 3, 5 weeks | ... |
| G. P., 41, m. 10 years | July 3 | July 17 | ... | ... |
| A. C., 35, m. 3 years | July 5 | Died Aug. 2 | 1, $2\frac{1}{2}$ years | 1, 3 months |
| E. G., 26, m. 9 years | Aug. 11 | Sept. 13 | 3, $4\frac{1}{2}$ years | 1, 2 months |

PARAMETRITIS CASES—*continued.*

| Seat of Disease. | Result. | Assigned Cause. | Remarks. |
|---|---|---|---|
| Psoas parametritis | Opened in thigh | Exposure after abortion | |
| P. transversalis | Opened by knife | Exposure after confinement | |
| Both sides | Resolution | Exposure after abortion | Walked to Hospital with retained placenta. |
| Left of uterus | Do. | Exposure after confinement | |
| Right of uterus | Do. | Exposure during catamenia | |
| P. inguinalis | Opened in groin | Exposure after confinement | |
| Left of uterus | Death | Suffering from chronic pyæmia, and aborted at 3d month | |
| Do. | Opened in groin | Exposure after confinement | |
| Right of uterus | Resolution | Do. | |
| Right and front of uterus | Do. | Abortion | |
| P. transversalis | Opened by knife | Exposure after confinement | |
| Both sides | Opened into bladder and rectum | None | Apparently idiopathic. |
| Psoas parametritis | Death. Opened in thigh | Exposure after abortion | Death from peritonitis and exhaustion. |
| Both sides | Resolution | Do. | |

# REMARKS

UPON

# RESECTION OF THE TENDO ACHILLIS IN PARALYTIC TALIPES CALCANEUS.

WITH

## AN ACCOUNT OF A NEW METHOD OF PERFORMING THIS OPERATION.

BY

ALFRED WILLETT.

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The treatment of talipes calcaneus in cases of infantile paralysis by an operation having for its object a shortening of the abnormally elongated tendo Achillis appears to me to have fallen into undeserved disuse. Scarcely any of the deformities classed generically under the term "talipes" are more hopeless as regards any natural tendency towards improvement than this; and although mechanical appliances are capable of affording a certain amount of relief, yet the mode of progression in these "heel-depressed" patients remains strained and jerking, whilst in cases where the deformity exists in both feet, even standing is rendered a very unstable position. It is especially in such cases, viz., where both feet are affected with paralytic talipes calcaneus, that shortening the tendo Achillis holds out a reasonable expectation of producing considerable improvement in the patient's standing and walking powers, always provided, of course, that the shortening of the elongated and attenuated tendons is a permanent change, *i.e.*, one that will endure the strain of exercise. I entertain the opinion that the method of operating heretofore adopted has been faulty, and one upon *a priori* grounds more likely to fail than to succeed; for surely it needs but little reflection to foretell the result of simply cutting out a piece of an atrophied tendon, and of depending for the success of this proceeding upon the tenacity of the cicatricial tissue filling up the gap between the divided ends, even although that interval be lessened by keeping the heel raised

during the healing stage. It is well-nigh certain that the uniting material would be, as indeed has been shown, simply fibrous tissue, and not homogeneous in structure with the tendon, as is desirable. Being strongly impressed with this inherent defect in the old operation, in planning the one which I performed in the following cases, I determined to splice at the same time that I shortened the tendon.

### Case I.

Henry J., aged 9, the son of a farmer, came to London on 6th October 1879, for the purpose of undergoing operation for talipes calcaneus affecting both feet, the result of infantile paralysis. The lad had been seen in consultation by Sir James Paget a few weeks previously, who concurred in counselling operative measures, as offering a reasonable expectation of improving his condition. When seen for the first time, some five years previously, this patient could not stand alone; all the muscles of both lower extremities, with the exception of the psoas, iliacus, and the glutei, were excessively atrophied, many, chiefly those of the legs, not responding at all to galvanism, whilst others, chiefly those of the thigh, did so but very feebly. There was quite a remarkable relaxation of the ligaments and tendons. The Achilles and other tendons at the back of the ankle were so elongated that the dorsal surfaces of the feet could quite readily be placed against the front of the leg. The normal prominent sharp outline of the Achilles tendons had completely disappeared, so that there seemed to be no structures between the integument and the posterior surfaces of the lower ends of the tibiæ and fibulæ, except two thin cords, the atrophied remains of these tendons. There was marked genu retrorsum in both limbs, and in the case of the left hip-joint, the head of the femur had escaped from the acetabular cavity, into which, however, it could, to some extent, be returned.

The paralysis was traced to a sudden illness when two years of age, in which it was found out he had lost the use of his legs. Convulsions were not noticed. From time to time appliances to suit the requirements of the patient as he progressed were fitted under my direction, and at this time, *i.e.*, October 1879, with the aid of only a stick, he can walk short distances not exceeding one mile at a time. He has regained considerable power over the extensor muscles of the thighs and legs, but the calcaneus deformity has correspondingly increased, the heels being more depressed, and the arches of the feet more raised. He is absolutely unable to raise the heels from the ground or to stand on tiptoe, and is extremely unstable either in standing or walking.

On 18th October, under the carbolic spray, and with all Listerian precautions, a Y-shaped incision, some two inches in length, was made over the tendo Achillis of the left heel, and continued in depth until the tendon was reached. At the lower or vertical portion of the incision, the dissection was continued until the tendon was fully exposed over its superficial and lateral surfaces for the space of one inch in length, its deep connections being left undisturbed; the tendon was now cut across at the point of junction of the oblique portions of the wound with the vertical; next the proximal portion was raised, with its superficial connections to the integument undisturbed, to the extent of fully three-quarters of an inch, by dissecting along its deeper surface; in point of fact, reversing the dissection made upon the distal segment. A wedged-shaped slice of the tendon was now cut off from both segments, that from the proximal being removed from the deep surface, whilst from the distal it was taken from the superficial, in both instances the bases of the wedged-shaped portions removed being at the point where the tendon had been divided. The heel being now pressed upwards, the proximal portion, including both skin and tendon, was drawn down and placed over the distal, thus bringing the prepared cut surfaces of the tendon into apposition, in which position they were held by an assistant, whilst four wire sutures, two on either side, were passed deeply through the integument, then through both portions of the tendon, and again out through the integument, and fastened. When completed, the united edges of the wound assumed a V-shaped appearance, owing to the angle of the proximal portion being now attached to the terminal point of the distal portion of the original incision. A precisely similar proceeding was then conducted upon the right heel, and after the dressings had been applied, moulded gutta-percha splints were fitted along the anterior surfaces of either leg and foot, to keep the heels well raised, as well as to prevent any involuntary movement. The wounds healed by first intention, and no constitutional disturbance was excited. On the 30th October, the wounds being completely healed and the sutures removed, "silicate" bandages were applied, and the lad returned into the country on 4th November.

I have seen him on three occasions since, in January, April, and July of the present year. He was not permitted to walk until January. Between this period and April he walked with the feet encased in silicate splints, and between April and July in boots with side-iron supports, so constructed as to prevent the heels dropping. At this visit his condition was markedly improved; he could both stand and walk upon his toes, whilst his general stability when upon his feet was much greater. The tendons,

where they had been spliced, were thickened, and stood out fairly prominently, clearly having united firmly in the positions in which they had been planted. The skin was pliant and supple over them. The scarring was trifling.

### Case II.

Charlotte D., aged 2½ years, with talipes calcaneus of right foot, the result of an attack of infantile paralysis, was admitted into Sitwell Ward on 7th November 1879. The child could not walk alone, but when helped, dragged this foot after her, the heel only being used in progression. Although so young, I thought it well to perform the operation previously described, which was done on 13th December. The wound healed rapidly, and when she left the Hospital the foot was in good position, the heel being well raised; indeed, if brought down beyond the right angle the child cried out. She was then taken home, and although directed to be brought to have a boot and iron fitted, the child has not been seen at the Hospital since.

### Case III.

Charles H., aged 6 years, admitted into Lawrence Ward with paralysed left leg and resulting talipes calcaneus of four years' duration. He was operated upon on 19th April 1880, in the manner previously described, with equally satisfactory results as regards the well-doing of the wound and improvement in the position of the heel, and also of muscular power; for when seen on 11th June the following note was made:—"Left foot, the tendo Achillis stands out naturally; he can extend the foot to a right angle; there is still some abnormal concavity in the sole of the foot."

The first and third of these three cases show, I contend, that by operative measures it is quite practicable to effect a *permanent* shortening of these abnormally elongated tendons, whilst the second gives support to this opinion. It is reasonable, moreover, to expect that, with a more normal condition of the tendons, these patients will improve in their powers of progression, and, as far as the calf-muscles are capable of restoration, they will regain some portion of their lost functions; an improvement in my experience frequently observed in this class of case, where the patient's muscular wasting has been in part dependent upon disuse, and who, having been supplied with mechanical aids, have commenced to walk, thus exciting in the atrophied paralysed muscles some restoration of function.

# PORT SANITARY WORK.

BY THE LATE

## HARRY LEACH.

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[The following unfinished article on "Port Sanitary Work" was written by the late Harry Leach during the last few weeks of his life. It was his intention to have finished the article in time for our last year's volume, but the hand of death was upon his whilst he worked, and death overtook him in the midst of his labours on November 26, 1879.

A very brief sketch of Mr. Leach's public life may interest those of our readers who were not personally acquainted with him. In the year 1862 he received his first public appointment, being Resident Physician to the Dreadnought Hospital for Seamen. In that capacity he very soon showed the remarkable talent he possessed for administrative work, and the interest he took in State medicine. It was mainly owing to his energetic efforts that in 1868 the Merchant Shipping Act was amended, and a great improvement introduced in the inspection of the anti-scorbutics supplied to the mercantile marine.

During the cholera epidemic of 1866, and upon the removal of the Dreadnought Hospital to Greenwich, Mr. Leach had an opportunity for displaying the power of organisation which he possessed in a remarkable degree. His services on these occasions led to his being appointed by the Corporation of the City of London, Medical Officer of Health for the Port of London, when they first instituted the office in 1873.

It is in connection with this office that Mr. Leech's name will be associated; on him devolved the difficult task of drawing up the regulations for the Port of London, and of laying down the principles which should guide port sanitary officers in their duties.

His official work, heavy as it was, did not prevent him interesting himself in other questions of great and national importance, such as the drainage of the Thames valley, the condition of the Thames below the sewage outfalls, the construction of hospital

ships, &c., &c., nor from occasionally contributing to medical literature. Many of our readers will recollect his paper on the outbreak of scurvy in the late Arctic expedition, which was published in the thirteenth volume of these Reports.

During the last few years of his life, failing health compelled him to obtain temporary leave of absence from his official duties, but his activity of mind and cheeriness of disposition, which formed the distinguishing traits of his character, did not desert him; and to the very last, as this article shows, he worked on for the benefit of our sea-going population—a subject of the greatest national importance, in which Mr. Leach may almost be regarded as a pioneer, and to which he devoted himself with equal zeal and success.—W. S. C.]—

## PORT SANITARY WORK.

By the courtesy of those who are responsible for the articles inserted in these columns, the writer is paid the compliment of being permitted to offer to the alumni of his own school the following remarks on a subject that, at all events, fifteen or twenty years ago, would have been passed by with disfavour, if not with scorn, by the most friendly editor. For, in verity, the subject is for the most part more administrative than scientific, and necessarily comprises that which can interest but a comparatively small section of our readers. Nevertheless there will in all probability be among them a comparatively large proportion of medical officers of health, and so again a comparatively large sprinkling of those who have chosen to exercise their energies on floating habitations, and to show how men, women, and children can best be kept in health, and free from zymotic and other preventible diseases, with a minimum allowance of air, and under circumstances peculiarly unfavourable to the maintenance of sound sanitary conditions. Hence, as regards practical knowledge about prevention of disease, no arena is better than an army transport or emigrant ship, a school ship or a coolie ship, or, if we ascend in the social scale, a large passenger ship steaming between the United Kingdom and the most distant of our colonies. So, if an apology were needed for this paper, it would exist in the fact that the department of public health has become of such importance, that the establishment of museums, professorships, and lectureships in sanitary science is rendered necessary; and I am convinced that one at least of these chairs should refer exclusively to that by no means insignificant proportion of Her Majesty's subjects who aid very practically in proving that "the seas but join the nations they divide."

With the exception of some brief but very concise, rigid, and often cruel enactments, no legislatives measures have been passed as to the health of those afloat. The Quarantine Act, in which these are contained, can be most conveniently quoted when we advert to one of the sections of this report that I shall call "Prevention of Disease," and so it may be left until this subject is reached.

I may fairly assume that it is well to begin by finding out as many particulars as possible about the house we live in, whether that house be fixed or floating. So many hours are now spent by a large proportion of individuals on the sea, that the comforts provided in the quarters assigned to them form an important item in the bill of fare. We may begin with the *ne plus ultra* of comfort afloat in this last decade of the nineteenth century, a deck or saloon cabin on board one of the West India, Peninsular and Oriental, or Cape mail steamships. I suppose that, at present, comfort here reaches its maximum in these vessels, although, as the liberal owners themselves will acknowledge, there is plenty of room for much scientific and practical improvement, as ventilation is now much complicated by the substitution of iron for wood in the main construction. Nearly all wooden vessels have an inner as well as an outer skin. Besides the natural porosity of the wood, channels can thus readily be formed to take out foul and introduce fresh air, so as not to disarrange the contour and general outline of the ship, watched by both architect and builder with great care and constancy. As a matter of fact, those who study the art of ventilation in the present day must consider the subject from, so to speak, an iron point of view. A single skin of this material, or an iron skin with a wooden framing, or, simpler still, a steel skin only, is given. Under these circumstances, with numberless closed spaces below, there is a tendency to very quick evaporation, and to a constant "weeping" along the inner surfaces of the outer sides, which in the tropics is usually continuous as well as excessive. In steamships a great deal of this is neutralised by the heat of the engines, but the mere fact of its presence shows the necessity for introducing channels whereby the foul air may as speedily as possible be eliminated from all the inhabited decks. And here it is well to remind my readers that up to the present time a friendly contest has been going on between two sets of theorists, one advocating the "plenum," the other the "exhaust" theory. The former, in brief, includes all the plans as yet adopted that have as their object the forcing of fresh air into any given space for the supply of those who inhabit it; whereas the latter comprises all inventions having as their aim and object the abstraction of the foul air, with no concern whatever as to that which is to take its place. It requires very little perspicuity in

such matters to sift the respective merits of these respective principles, or, as it appears to me, their comparative value. But it is surprising to find how many partisans are found for the plenum as well as for the exhaust plan.

Since the many varieties of ironclad ships commenced to be built, ventilating difficulties have of course increased and multiplied enormously, particularly as to vessels of the "Monitor" class; and it is curious to observe with what tenacity the Admiralty constructors and the advisers on hygiene (if any such there be) have clung to the plenum principle of ventilation. We may take H.M.S. *Devastation* and *Glatton* as examples. In both of these ships a very low freeboard exists, necessitating the frequent employment of artificial modes of ventilation, not only when the ship is in action, but when she is in a heavy sea. So, to accomplish what is required, large shafts are sent from some distance aloft to below the level of the spar-deck, where they are met, or rather occupied, by a certain number of fans, which, driven by a donkey-engine from the main machinery, collect the air from the shaft, and, by a very complicated system of tubes, force it into all the inhabited quarters of the ship. When the vessel is in action, the only exits for foul air appear to be—(1) a hollow iron beam facing the entrance to the aft steerage; (2) the spiral staircase from the aft staircase to the flying deck; (3) a circular screw skylight in the ward room, and one in the captain's cabin; (4) a stove in the aft steerage; (5) the hatchway of the fore-stays under the turret; and (6) from anchor bitts in the steerage and sick-bay. So that, under such circumstances, it is difficult to say how air can be supplied to those below if a shot should carry away or block the shaft through which the fresh air is collected. Would it not be better to create a simple system of exhausts, so that the air as soon as it is heated and foul shall be drawn from below, leaving a vacuum, which, as a matter of course, nature will immediately proceed to fill? There are, in fact, now so many natural aids to upcast ventilation in iron ships, that the exhaust principle seems to commend itself as a natural consequence. The hollow iron masts furnished to all ships of war, and to most large merchant vessels, can be utilised for this purpose by making apertures at any parts below the deck, and are specially valuable in drawing off the foul air from the nethermost parts of the hold, close to the spot where the mast is "stepped," *i.e.*, fixed. The strength of the draught is most glaringly perceptible to any one who chooses to climb to the upper end of the mast, and the quality of the air drawn from these profound and dismal regions will show by olfactory specialties that the atmosphere over which we live on board ship, is frequently but little better than that

normally present in a very badly ventilated sewer on shore, and this, too, in a vessel that has little or no bilge water.

If those interested in this subject care to pay a visit to the Parkes' Museum of Hygiene, at present located in University College, they will there see a simple plan of ventilation that I designed some months ago for adoption on any general first-class passenger ship trading to or through the tropics. It commences in principle by making use of the funnel of the ship as an exhaust agent. A large tube is run fore and aft on each side above the cabins and other inhabited parts of the vessel, communicating with these cabins, latrines, &c., by oval or circular openings, meeting opposite and connected with the funnel by a short transverse tube. Whenever the fires are alight, a strong current will be at once created in these fore and aft tubes, which draw the air continuously and persistently from the cabins as fast as it becomes heated, foul, and hence unwholesome. Whence the vacuum is supplied needs no discussion. Air must come in somewhere, close doors and bulkheads never so tightly. The orifices in the lateral tubes are guarded with sliding shutters, that can be closed by the over-sensitive, or those who really cannot bear too rapid a draught; and in case of fire, shutters are also provided at the junction of the transverse tube with the smoke stack. I am, up to the present moment, encountered, even by very intelligent builders, with an argument to the effect that perhaps the clean air would not come in or the foul air be removed fast enough.

The only vessels in Her Majesty's service really well ventilated are the *Serapis*, and other Anglo-Indian troop-ships employed in taking out and bringing home to and from India our periodical army reliefs. All engaged in port sanitary work should pay a prolonged visit to one of these ships and study her sanitary fittings particularly. Edmond's tubes, with gas jets, the masts, and a great variety of minor arrangements, all unite to make these vessels exceedingly comfortable, having regard to the fact that 1692 individuals are carried for many days in a cubic space infinitely less than that apportioned to each healthy pauper in a workhouse.

But cargoes, no less than passengers, require as a matter of safety to be fairly well supplied with air. There are special cargoes that still constitute an unsolved problem on this head, and coal is perhaps almost the worst of all. Vessels are loaded with wood and coal when they are fit to carry nothing else, and the stowing is of the loosest possible description. It seems strange to state that, as regards coal, it appears to be still an undecided question whether close or loose packing of the material is

the safer plan. Some months ago the Board of Trade seemed to believe in an abundant supply of air, for they issued a code of elaborate but not very clear rules on the subject, consequent on the alarming increase in the number of colliers previously reported as having gone to sea, and, after a considerable interval, had not been heard of. It is plain that this matter, among many others, is one requiring the attention of sanitary experts, and one to which the special consideration of port medical officers might be most profitably directed.

Some six or seven years since a very ingenious but simple system of ventilation was introduced by M. Thiers, called "Thiers's ship ventilator, fog alarm, and bilge pump." It is, indeed, the only automatic apparatus of the kind of which we have at present any knowledge. Two small tanks are placed on each side of the ship opposite each other, each pair being connected with a transverse pipe, one containing water and the other mercury. Those connected by that containing water have each another long pipe that is led into the hold, or to any other part of the vessel requiring ventilation. The tanks connected by the tube that contains mercury have pipes leading down to the neighbourhood of the keelson, and all these pipes are guarded by valves opening inwards. It is seen, therefore, almost at a glance, that this system is strictly automatic (a very great advantage in such systems afloat); for when the ship is in motion, any rolling, however slight, causes a vacuum on one side or the other, which is filled directly by the air from the hold in one tank and the water from the bilge in the other. The next roll of the ship forces foul air and water out of the top of the tanks. The apparatus will not, of course, act if the vessel is absolutely motionless. Favourable reports have been received from H.M.S. *Thetis*, *Vigilant*, and *Osborne*, on all of which vessels the plan has worked well.

Cowls are almost numberless in their variety, but those that act as exhausts, and are as automatic as possible, appear to be most successful. In the good mail, emigrant, and steam ships, it is instructive to watch how very strong an upward current always prevails (and that quite automatically) if a simple cowl is set with mouth back to wind (from, say, the end of the screw alley), from any cabin or other enclosed space below, that has no other means of entrance or exit; or, of course, most markedly, if Edmond's plan be adopted, by burning a jet of steam nearly at the top of the tube, which makes it a strong upcast at once, which ever way the cowl be turned, or indeed whether there be cowl or not.

It is convenient in this place to remind our readers that advice about the ballasting of ships is by no means an unimportant

matter. Well-accredited instances are quoted in the United States of yellow fever having been undoubtedly conveyed from one port to another by foul material gathered promiscuously from the beach for ballasting purposes; and hence our own Board of Trade thought well some four years ago to issue a circular order to all British ships, that when this disease is known to be epidemic, vessels should not be ballasted from the beach. But it is probable that maladies other than yellow fever may be propagated in this way, and it is fit that all shipmasters should exercise care on this head.

The ordinary work of ship-to-ship visitation, as carried out by port sanitary inspectors, under the instructions of their medical officer, will be chiefly confined to an inspection of the forecastles, deck-houses, galleys, and closets or "heads" used by the crew, including all that is technically called in legislative parlance "accommodation." Large sailing ships, whether built of wood or iron, are usually arranged with a top-gallant (*i.e.*, upper) forecastle, and a house on deck near the mainmast. In coast steamships, the crew as well as the engineers and stokers are usually located below, but in separate quarters—all these quarters, as a rule, being of ample dimensions and fairly ventilated. Indeed, few real complaints can now be made on this score if the berths, decks, &c., are kept clean. (I refer now to good-class ocean-going ships, many of which have a surgeon constantly on board.)

The next class, descending in the scale of vessels, would include Mediterranean and North Sea and Baltic ships, steam and sailing, used almost exclusively for cargo—the men, in many cases, agreeing to diet themselves, and signing only for what is called the "run." This is a most pernicious system, for all means are employed to economise rations. Most of the crew take insufficient supplies, and if the master did not serve out to those who want it additional food, at, of course, famine prices, illness would result, little or no work would be done, and the vessel would probably be lost. In these ships also, although the accommodation is ample, the quarters of the crew are scarcely ever in good sanitary condition. For the work of discharging cargo commences immediately after the ship has arrived at her moorings, and proceeds without intermission. Goods are taken in again at once, and so, of course, no time can be found for eating, and very little indeed for rest. These are, in fact, the vessels that, as regards the Port of London, are sources indirectly of more sickness and mortality among the crews than any others. Life is carried on at very high pressure, and few can withstand many years of the work, if we take into consideration the fearful wintry nights of

the North Sea, the gales of the English, St. George's, and Irish Channels and the Bay of Biscay. For we may include among this class all the smaller colliers and other vessels that trade between the Thames and the Northern and Irish ports, and those on the coasts of France and Holland, shoals of which steam or sail in and out all the year round; the risks of our ocean-going floating castles being almost *nil* as compared with the hourly perils that the above and their crews undergo, not less from the elements than from the imprudence of the men, the carelessness of their owners, and the ignorance of their masters.

With these evils the health officers have as a rule little or nothing to do, unless complaints are made that an article of diet is unfit for consumption. A seaman can, for instance, complain at an outport that the food served out is uneatable, and may call upon the health officer to adjudicate thereon, in accordance with the provisions of the 116th and following sections of the Public Health Act of 1875. This occurs, comparatively speaking, but seldom. Still, cargoes of articles intended for the food of man, from the carcases of oxen downwards, are frequently landed in a doubtful state, the officer may be called upon to examine such a freight, and hence it is manifestly of great importance that he should be familiar with the normal, as well as abnormal, state of raw meat, tinned and other varieties of preserved food, much of which, as I can vouch for from experience, is frequently in a condition which renders it difficult to decide how far it is fit for consumption. It must, however, be remembered, that in all these transactions it is often a very awkward and delicate proceeding to determine whether any particular accumulation or deposit is a nuisance or injurious to health, and that the existence of a foul smell does not, as a matter of course, establish this fact conclusively.

Inasmuch as water is now acknowledged at all hands to be an eminent disease carrier, one of the first and most important duties of a port medical officer is to pay special attention to the state of the drinking water on board every vessel within his jurisdiction, whether the vessel be a large ocean-going steamer, or a small collier or barge that may be trading between Brentford and Sheerness. Indeed the latter class is of much greater consequence than the former.

The source of origin and mode of storage are of course all-important considerations. In this port almost half the drinking water is supplied to vessels both in the river and the docks by some nineteen or twenty water barges, belonging chiefly to a small company called the "Samaritan Water Barge Company." These barges vary in size, holding from 25 to 100 tons of water, are

square built, made of wood and iron, and well tarred inside and out. The water is taken from the service of the New River Company, is conveyed alongside vessels as it is required, and sent into the tanks by ordinary pumps worked by two or three men. In some docks, water is laid on to the edges of the wharves and pumped directly into the ships. But off Gravesend, where, on account of the extensive draught, much of the water required by the large Colonial and Indian ships is taken in, a system similar to that of the Samaritan Company prevails.

The barges are kept clean, being examined from time to time by the inspectors, and the plan is reasonably safe and successful, if care be taken that the ends of the pipes are not fouled by dragging them through muddy spaces on shore; for carelessness in this particular may cost the life of one or more individuals, and it is extraordinary with sailors, and all connected with ships especially, how much indifference is exhibited in such little matters. But assuming that the water when it arrives on board is as good in quality as that supplied from the same source to houses on shore, it is the special province of the health officer to see that the storage is good and is kept in good order. Wooden casks, formerly the usual mode of storage, are now very seldom used to store water afloat. They are apt to leak, foul easily, are cleaned with difficulty, and do not last so long as iron tanks, which are in all respects the most convenient vehicles for this purpose. For they can be made to order so as to fit any hole or corner of the vessel, or are usually built up square of various sizes, with two or three small ones for the spar and 'tween decks. In ships where sanitary conditions are really a care and concern to owner and master, a small filter tank of Colonel Crease's (or some other well-known pattern) will be found most useful. The filtering medium in Crease's tank is animal charcoal, and hence it is easily cleaned, for the cleansing medium is practically indestructible. The tank vessel can be procured in almost any size, and if kept in constant use for crew, passengers, and every one else on board, I believe that all may be considered safe from any disease carried by the water consumed in that particular ship. Too much in the way of caution cannot be said and written as to the filling up of the tanks at foreign ports. River water is still used at Calcutta, Galatz, Constantinople, Hamburgh, and many other chief ports, by the owners of mediocre ships; is left to what is called "to settle" for a few days, or is occasionally treated with alum; is pronounced clear and sparkling, and of course possessing those qualities eminently potable; and so the captain starts, quite satisfied that everything requisite has been done.

The diminution of chronic dysentery during the past ten years

at Calcutta, Cochin, Hong-Kong, Shanghai, &c., proves that, among other preventive measures, more care is taken about the drinking water served out to ships' crews trading from these ports, and the severity of the cases entered from these places in the Seamen's Hospital has lessened considerably. But it would be well to induce, if possible, agents and owners of ships to establish, by consular influence, a sort of water depôt, where, as in London and some of the outports, any amount of really good water can be put on board by giving notice.

# PROCEEDINGS

OF

# THE ABERNETHIAN SOCIETY

FOR WINTER SESSION, 1879–80.

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*October 9.*

Mr. Vernon delivered the introductory address, after which a vote of thanks was passed, coupled with a request that it might be printed *in extenso* in the Hospital Reports.

*October 16.*

Mr. Bruce Clarke read a paper on the treatment of hæmorrhage.

The various means for the arrest of hæmorrhage were first considered, including ligature, pressure, torsion, acupressure, &c. An allusion was then made to the makeshifts of necessity, and the promptitude that was required in dealing with all such cases.

The variety of treatment which could be employed in primary, recurrent, or secondary hæmorrhage was next considered, and a variety of cases quoted to show how urgent was the need of dealing promptly with secondary hæmorrhage. One case,[1] in which transfusion was successfully employed, was referred to somewhat fully, and the difficulties which beset this operation were dwelt upon at some length.

*October 23.*

Mr. Day read notes of a case of abnormal cerebral sinuses, in which the right lateral one was absent, and its place supplied by the right occipital sinus greatly enlarged.

[1] *Vide* St. Bartholomew's Hospital Reports, vol. xv. p. 270.

He also showed an occipital bone, the grooves in which showed the same peculiarity.

Mr. Day then showed some human hair of a moniliform appearance, with regular constrictions and dilations, the medulla being absent at the constricted portions.

Mr. Lockwood then read a paper on syphilis, which will be found at page 277 of the present volume of Hospital Reports.

*October* 30.

Mr. Griffith showed a specimen of contracted pelvis taken from a girl at eighteen.

Its diameters were—

| | |
|---|---|
| Antero-posterior, | 3 inches. |
| Oblique, . . | $4\frac{1}{4}$ „ |
| Transverse. . | $4\frac{1}{2}$ „ |

In this case a strong instrument was broken in performing kephalotripsy.

Mr. Griffith also showed a new kephalotrite, designed by Dr. Godson. It differed from those of ordinary construction in being heavier and stronger, and in having a winch-like handle of great power to screw it down.

The following resolution, proposed by Mr. Griffith and seconded by Mr. Coles, was read by the President and passed without discussion :—

'That the Society learns with great regret the unexpected death of Mr. Callender, and desires to place on record its deep sense of the loss the Hospital and the School have sustained thereby.'

Mr. Schofield read a paper on the 'Medical Aspects of Vivisection.'

*November* 6.

Mr. Doran introduced a discussion on 'Septicæmia and Pyæmia.'

Mr. President and Gentlemen,—When informed by Mr. Bruce Clarke, during the past summer, that the Abernethian Society had decided upon requesting me to choose and to introduce a subject for debate, I at once felt the full extent of the honour the Society had conferred upon me, and at the same time was struck with a deep sense of responsibility as to the choice of a subject.

The subject I have chosen is 'Septicæmia and Pyæmia,' which, when referred to collectively and not separately, I shall speak of as 'blood-poisoning.' It is true that many other diseases deserve to be grouped together under this head, but it is highly convenient for our present purpose to use the expres-

sion in this limited sense, which we may do without falling into error, since septicæmia and pyæmia are blood-poisoning in its most literal signification.

Having myself been dresser and house-surgeon to St. Bartholomew's Hospital, I have had an opportuuity of finding out not only what can be learnt by the holders of those appointments, but also what is best learnt under the circumstances—a most necessary limitation. For when house-surgeons or dressers, we have the chance of applying ourselves to the study of certain subjects which will probably never be presented to us in so favourable a manner after our term of office has ceased. I refer to the clinical features and the practical details of surgery. Let the microscope, and, still more, the post-mortem room, be not entirely neglected, but be reckoned of secondary interest by us when house-surgeons. The clinical aspects of the results of injury, the appearances of disease remediable by operative interference, and the practice and perfection of such interference, are what then concern us almost entirely.

I say this, because otherwise we might be spending two hours or more to-night in discussing the vast unsettled question of the germ theory. The most practical part of this subject is the inspection of the germs themselves under the microscope and their cultivation; but this is not work for us. Indeed, as to the rearing of bacteria, I consider it our duty when working at practical surgery to avoid such experiments. It might lead to disastrous results in our patients, and in that way would be more dangerous than the chemist's study of poisonous gases, or the pathologist's investigations into the metamorphoses of the tæniadæ, which, through slight carelessness, has ended in the appearance of tapeworm or hydatid disease in the experimenter.

Let us, then, look upon blood-poisoning clinically, and see how far we can battle with the two terrible diseases which, for this evening, we include under that name. We need not at present talk about prevention, since that would introduce another vast question, the discussion of which might be unlimited. It is a mistake to suppose that we must necessarily talk about the respective merits of the 'antisceptic system' and of 'general attention to simple cleanliness' because we are discussing pyæmia. The house-physicians might spend a good evening here in reasoning on the clinical features of enteric fever without feeling bound to argue about the drainage of towns and the surveying of houses; we will conduct our discussion on the same principles. We will talk about the appearances of patients stricken with blood-poisoning and the steps we can take to avert the great tendency to death in such cases.

During the past six weeks I have paid frequent visits to this Hospital, and asked the house-surgeons to kindly show me a case of blood-poisoning; but fortunately they have not been able to comply with my request, no cases having lately occurred. However, you are prepared, gentlemen, to meet with an instance of blood-poisoning any day. A bad compound fracture may be clumsily dressed, and the lint and bandages allowed to get foul before the patient is brought to you in the surgery, or you may have to take charge of a case in which an operation has involved much damage to internal organs or intricate serous or synovial cavities. Accidents will happen, and patients may always get their wounds contaminated before they can obtain skilled assistance, and no 'system' yet pretends to overcome *de facto* septic infection, however it may claim to keep off blood-poisoning when the precautions can be taken before the wound is inflicted.

Now, the typical case does not seem in a bad way at first; the features of the patient probably express slight shock, or show what we see when a man is smarting from a recent wound, that is, an expression of pain without anxiety. Next day the face is more placid, the temperature has most probably risen a degree or two through conditions known as 'surgical' or 'inflammatory fever.' But in a day or two we somewhat suddenly find that the temperature has risen to 102° or more. The patient's face has assumed an unpleasant aspect; it seems much thinner than it was a few hours before; the expression betokens anxiety, not pain; and on speaking to him, we find him reserved and apathetic, as in the severe specific fevers. I do not think any of us expect to find that there have been rigors. For myself, I should be rather astonished to hear that the patient had shivered. Were I assured that a rigor had occurred, I should not be at all surprised to find that the patient had been subject to ague. An attack of this complaint has often followed an operation, and naturally frightened the surgeon. But even when it commences a week or more after a wound has been inflicted, it develops rigors in a more rhythmical manner than true pyæmia, nor does pus form. In blood-poisoning, developed early after injury, we rarely see rigors, and when they occur within a very few days after operation, we find that suppuration is present. Thus in Case 59 of Mr. Savory's 'Statistics of Pyæmia,' in volume iii. of our Hospital Reports, a rigor occurred two days after operation, followed by death seven days later. Extensive abscesses were found in the liver, lungs, and left orbit; besides, the operation had been performed for necrosis, so that suppuration had existed before the knife was used. Then, to return to our typical case, we see other symptoms said to be

'typhoid.' Delirium sets in, varying between a mere irrational levity of manner, which is the rule, to very violent excitement, which is less frequent. Even in these days, the patient generally dies in a few days, often lingering on for several hours after a steady fall of temperature, which is a very grave symptom when the general condition of the patient is getting manifestly worse during the fall.

We are not surprised if the surgical registrar tells us that he could find 'nothing' at the post-mortem of the case. No pus is to be expected anywhere; the blood is almost certain to be dark and to coagulate imperfectly, but we expect no visceral lesions. The bases of the lungs always show signs of recent congestion, according to my personal observations. Yet Billroth asserts that the lungs are normal in these cases, and his experience in autopsies is very great.

Such is septicæmia. Not very long ago a man with septicæmia was considered to be doomed, but it was soon shown that it was neither of necessity deadly nor always acute. Now, even septicæmia in its most fearful forms may be faced by the surgeon, and death averted by active treatment. What is more strange, it may take on a chronic type, without ever assuming the pyogenic nature of pyæmia.

But what is to be done when we have to rescue a man stricken with septicæmia? Purgatives, salines, and similar remedies may be necessary, but are at the best quite accessory curative agents. Cleanliness is imperative, but the most perfect dressings will not now save the patient. As to specifics, none are known. The kidneys, generally impaired in their functional activity, we may incite to secret urine, but the patient is not much benefited when we are successful. Besides, mischief going on in these organs during blood-poisoning does not always manifest itself by the ordinary morbid appearances in the urine. I have on several occasions tested urine in such cases, and found no deposit nor any trace of albumen, nor excess of urea or phosphates; and yet, on examining the bodies of the patients after death, I have found mottled, pale, or highly congested kidneys. Their condition may not have been sufficiently morbid to incapacitate them from separating ordinary waste material from the blood, yet they were not strong enough to eliminate from the system the poison that is destroying life. Hence the urine is normal, whilst the kidneys are too weak to save life by throwing overboard into that secretion material which is worse than common nitrogenous waste.

But there is always one indication in septicæmia that we watch so eagerly, that we soon come to look upon it as more

than a mere sign or expression of extremely rapid waste of tissue. This is the great rise of temperature. Now, the explanation of some of the subtle causes of death in blood-poisoning may be screened from us; leucocytes may be useless for nutrition or deadly to the system when damaged in some way by bacteria; but one thing is more certain—the hot blood is taking the lion's share in killing the patient. Germs may affect the medulla oblongata or the walls of the heart, but that the increased heat of the blood may in itself imperil the functional activity of these vital organs there can be no doubt. Now it happens that while we know as yet of no remedy to act directly on germs already scattered throughout the system, the increased heat of the body can be reduced by active treatment.

I mean by wet-packing, by the ice-cap, or by the cold bath. These appliances were first employed by the physician for specific fevers. In rheumatic fever, the results of active reduction of temperature have been, I understand, very good. As to enteric fever, I find from a valuable paper recently contributed to the 'British Medical Journal' by Dr. Collie, of the Homerton Fever Hospital, that in the severe cases the bath was inadmissible owing to its general depressing effect, especially on the pulse, whilst in milder cases the relief was only temporary. Septicæmia bears a certain resemblance to enteric fever, especially when the temperature rises very high. Such cases of septicæmia, judging from Dr. Collie's experience, would be, by homology, unsuited for wet-packing or the bath. But in actual fact this treatment does not depress in cases of blood-poisoning; for the blood and the tissues being cooled, one very bad influence is removed, and the chance of safe elimination of the morbid products increased. All this time, too, the period of the operation or injury is getting more and more distant; the share which shock may have had at first is diminishing; the actual wound may be partially healing. The case is otherwise in typhoid; for whilst in septicæmia we may see spontaneous cure in twenty-four hours or a few days, the specific fever is bound to take its time. Thus when we refrigerate a man in the second week, he is bound to run the dangers of the third; but when we 'pack' in a case of septicæmia, the septic influences may cease in a few hours, during which the patient may keep alive with blood of a normal temperature, yet die if the temperature of his body remains at 105°.

Of the methods of reducing temperature in septicæmia, wet-packing is the best in the very severe cases. At the Samaritan Hospital I have seen cases of patients who, after the removal

of ovarian cysts, have suffered from the worst forms of septicæmia, owing to the fact that the cysts had previously been tapped, so that air had been admitted into the abdominal or cystic cavity, and septic influences thereby introduced, rendering antiseptic precautions unavailing. In one instance the temperature rose to 105.8°; on the sixth day the patient had tetanic spasms, and presented in other ways the worst features of blood-poisoning. Packing rapidly reduced the temperature; twice in the two following days it rose to over 105.5°; twice again was wet-packing employed, the last time with permanent success. The relief of all the other bad symptoms every time the temperature was artificially reduced leaves no doubt as to the absolute direct efficacy of packing in this case, at least, and I know of several similarly brilliant examples of a successful struggle with death by this method. But the packing must be commenced immediately the temperature has risen, and the surgeon expecting such a rise must be constantly watching the patient. By such vigilance I have known my senior colleagues, Dr. Bantock and Mr. Thornton, to actually save three lives.

When the temperature rises above 102°, it is advisable at first to try the ice-cap which very often produces the best results, and prevents a rise to 104° or higher, which would indicate a necessity for packing. Some patients feel great comfort after its application; some hate it; but all appear to derive great benefit from it whenever it is applied in time, and not left till the temperature has stood over 102° for several hours. The ice-cap in its most improved form is made with the tubing flat on the inner side, as when the tubes were circular much hot air could remain between the coils. Of all artificial methods of refrigeration it is the most convenient.

When we turn to true pyæmia, we need not say much of the symptoms, for they are so well known to us. Rigors, metastatic abscesses, embolic infarcts, &c., are household words to the modern surgeon. We sometimes observe what may be called a chronic form of septicæmia, typhoid symptoms and high temperature supervening two or three days after operations, and lasting several weeks, without the formation of pus. But, as a rule, the main feature of blood-poisoning late after injury is the formation of pus in certain parts of the body, preceded by rigors.

I am less sanguine about the results of artificial cooling of the body in pyæmia than about the effects of that treatment in septicæmia. Though the shock of the injury has longer passed

off in pyæmia, there must have been some mischief lurking in the system for the week or fortnight preceding the first rigor, and this mischief cannot have failed to greatly impair the patient's resisting powers. Besides, when the temperature is lowered, there remains the collections of pus as active foci of secondary infection, as bad as the first septic cause, and not to be influenced by cooling. Fortunately experience has shown that general measures, the cautious administration of stimulants, and the early opening of the more superficial abscesses, which should be well washed out with antiseptic solutions, often succeed in overcoming pyæmia.

Such are septicæmia and pyæmia. The manner in which they should be met by the surgeon affords us quite sufficient opportunities of discussion to very profitably occupy this evening.

*November* 13.

Mr. Schofield showed some photographs of ichthyosis.

Mr. Hoyle read notes of a case of malignant disease of the right kidney in a girl aged 14.

Mr. D'Arcy Power then read a paper on ferments.

After dwelling upon the importance of the subject from a practical as well as from a theoretical standpoint, it was shown that the ferment was, to a certain extent, comparable with the vital principle. Ferments were divisible into two main groups—the morphological or particulate, such as the saccharomycetes, and the non-morphological, of which the majority of ferments present in the animal body might be taken as the type. A short history of the morphological ferments was then given, and the various theories which have been promulgated in regard to their action were mentioned. The morphological ferments were shown to belong in every case to the vegetable kingdom, whilst the products to which they gave rise were divided into substances which were of commercial value, such as vinegar, alcohol, &c., and those which were simply products of putrefaction, the latter class resulting from the growth of various forms of bacteria. It was also sought to show (on the authority of Hoppe Seyler) that there exists a special unorganised ferment in bacteria and others of the lowest organisms which produces these processes of decay, and thus that in the end all ferments could be reduced to a single class. The schizomycetes occur normally as bacteria in the alimentary canal of man, where they appear to carry on the pancreatic digestion of albumins to the formation of the ultimate products of their decomposition. Turning, then,

to the non-morphological ferments, they were classed as amylolytic, proteolytic, and inversive ferments. Of these, the amylolytic ferment occurs as diastase in the vegetable kingdom, whilst a proteolytic ferment, active in an acid medium, has been isolated from carnivorous plants as well as from the common bean. There are also certain ferments which are found in the animal kingdom but which have not as yet been discovered in the vegetable kingdom, and *vice versâ*. Of these, the most important are ferments obtained from the mucus of the stomach, a milk-curdling ferment in the same organ, and the ferment in the pancreas which splits up fats into glycerine and a fatty acid, whilst in the vegetable kingdom are found emulsin or synaptase, myrosin and erythrozyme. The zymogen theory of the formation of ferments by the secreting cells from a common substance in the blood, and the inherent differences in the ferments themselves, was then briefly considered. Lastly, it was shown that some ferments, viz., trypsin and pepsin, were normally excreted, though only to a small extent, by means of the urine.

*November* 20.

Dr. Ormerod read a paper on ' Medical Electricity.'

The subject of medical electricity may be considered from several points of view, but it is proposed to dwell chiefly on one, viz., its use as a means of investigation. Electricity is of diagnostic value in cases of paralysis, because in some cases the muscles contract under the current like healthy muscles, in other cases their electro-contractility is more or less impaired. Thus, in a case of hemiplegia, the muscles of the paralysed side respond to the faradic current as well as those on the sound side ; but in a severe case of facial paralysis the paralysed muscles refuse to contract. Well, with regard to the electro-contractility of paralysed muscles, a generalisation has been made, which forms at least a good working hypothesis. In the anterior horns of the grey matter of the spinal cord exist large ganglion cells connected with the anterior (motor) nerve-roots. These cells are thought to be the centre for a variety of processes—for the nutrition of the muscles, for reflex action, for their electro-contractility, which is a form possibly of reflex action. If, then, these ganglia are destroyed or the connection between them and their muscles destroyed, not only are the muscles paralysed, but they rapidly waste and their electro-contractility disappears. If, however, only the volitional centre (that is, the cerebral) be diseased, or if the connection between

this and the spinal ganglion be cut, then the muscle is paralysed, but it does not waste and its electro-contractility remains. We must, however, go further, and distinguish between two kinds of electro-contractility. In the cases of paralysis from lesion of the spinal ganglion or nerve-trunks, the muscle refuses to contract under the induction current; but if we apply the battery current with slow interruptions, it contracts much more readily and to a much weaker current than does a healthy muscle. So, then, we have in paralysis of this kind three facts associated —wasting of the muscle, decreased farado-contractility, and increased galvano-contractility. These modifications of the electro-contractility of muscles are called the 'reactions of degeneration.' Different phases of them are described by Erb, and believed by him to possess special diagnostic and prognostic value. Let us now take some of the principal kinds of paralysis and see how the electro-contractity is modified in them. In paralysis of cerebral origin, no matter what the source of the lesion is, embolism, hæmorrhage, softening, or what not, the electro-contractility of the muscles is not lost. Next, in spinal diseases, suppose a case of angular curvature sufficiently severe to cause paraplegia; the electrical reaction of the muscles will be preserved, for though the connection with the brain is cut, the spinal ganglia and the nerves connecting them with the leg muscles are intact. But in infantile paralysis, which consists in disease of these very spinal ganglia, the reactions of degeneration manifest themselves just in proportion to the gravity of the disease. Progressive muscular atrophy is said to depend upon the same lesion; but here, somehow, the electrical reactions are not quite the same, for the induction current continues to cause contraction of the muscle until the muscular substance is completely wasted, the diminution in contractility proceeding *pari passu* with the atrophy. Next take the case of peripheral paralysis—paralysis due, that is, to lesion of the nerve-trunk after it leaves the cord or the brain. A variety of such lesions may be imagined—pressure on the nerve from an aneurism or other tumour, invasion of the nerve by malignant disease, syphilitic disease, rheumatic disease of the nerve-sheath, wounds, bruises, and many other causes. But in all severe cases of this kind, whatever the cause, the reactions of degeneration appear, and their course is determined by the severity and permanence of the lesion. A different class of cases, however, will doubtless occur to our minds, in which the wasting and the reactions of degeneration are very marked, but in which the cause appears to be constitutional, and to have no local seat—I mean lead-palsy. Recent investigators, however, believe that in these cases the

spinal ganglion cells are picked out by the poison, much as they are affected in infantile paralysis; so that according to this view, cases of lead-palsy would be brought under the generalisation which has been mentioned above.

One or two instances may be given of the practical application of these principles. A woman, aged 57, was in Elizabeth Ward with what appeared to be ordinary right-sided facial paralysis. A few symptoms, however, pointed to the possibility of cerebral disease. The electrical test showed that the muscles of the right side of the face would not contract at all under the induction current, while under the battery current, slowly interrupted, they contracted much more readily than the muscles of the left side. This, then, pointed to a lesion of the nerve-trunk, not of the brain, and the subsequent course of the case ratified this view. Again, a middle-aged woman came to the Metropolitan Free Hospital with paralysis of one arm. Her general appearance suggested hysteria as the cause, but the complaint of severe pain and the presence of an herpetic rash along the course of one of the cutaneous nerves made me hesitate as to the diagnosis. However, the contractility of the muscles proved to be normal, so a lesion of the nerve-trunk was excluded, and one day the paralysis got suddenly well. I may also quote a third case, so far as it bears on the present subject, the details of which were published in the Hospital Reports for 1879.

A man, aged 46, came complaining of loss of power in the left arm, with pain in the neck and down that arm. There was soon well-marked paralysis, and in addition the left deltoid and biceps began to waste; their farado-contractility disappeared, their galvano-contractility became augmented. These facts pointed to some lesion of the nerve-trunks, but the subsequent course of events seemed to negative that view. For the other arm became paralysed, then the legs, bladder, trunk, &c., and he died. The post-mortem showed a cancerous tumour springing from the dura mater in the cervical region; it infiltrated the roots of the left brachial plexus, and had thereby caused at first the symptoms of a peripheral paralysis; it also compressed the spinal cord in the neck, and had thereby caused the general paralysis whereof the patient died.

Mr. S. Paget then showed a stethoscope used by Lænnec.

### *November 27.*

Mr. Coles showed a man with paralysis of the left hypoglossal nerve, supposed to be caused by a small tumour in the neck.

Mr. Griffith showed a girl on whom excision of the knee had been performed by Mr. Callender five months previously.

Mr. Griffith showed a specimen of embolism of both pulmonary arteries, from a case of phlegmasia alba dolens with plugging of the iliac veins.

Mr. Gripper read notes of a case of fracture of the skull with concussion of the brain, which ended fatally, and he described the post-mortem appearances.

Mr. Lukis read a paper on the 'Germ Theory of Disease.'

The germ theory of disease is simply this: 'That many diseases are due to the presence and propagation in the system of minute organisms, having no part or share in its normal economy.' Origin *de novo* has no part in it, but belongs to that of heterogenesis. As a rule, these two theories have been mixed up, and Panspermists have upheld the germ theory, whilst Heterogenists have regarded it as retrograde and untenable. This, however, is a great mistake, and has caused endless confusion.

In this paper the subject is treated clinically; endeavours are made to show 'the competence of germs to produce the phenomena of disease, with especial reference to the specific fevers,' and all reference to their true nature, on account of the numerous varieties of opinion on that subject, is omitted.

1. *Phenomena of contagion.*—After the absorption of an infinitesimal portion of a specific poison, followed by a definite period of latency, there occurs a characteristic train of symptoms, on the subsidence of which (as well as during their course) there is an elimination of the poison, which has increased a thousandfold, and is capable of infecting almost an indefinite number of persons with identically the same disease.

No ordinary poison could cause such a series of phenomena. Only two reasonable hypotheses remain—(1) The poison acts as a ferment; (2) the germ theory.

In support of the former theory, the way in which a small portion of oxalic acid can decompose indefinite amounts of oxamide, the oxalic acid itself being indefinitely increased at the same time, has been advanced to prove that a substance capable of producing change in others may during that change be reproduced indefinitely independent of germs. This is, however, found to be a fallacy on close investigation. This physico-chemical theory, too, is inadequate to explain the peculiar development and decline of contagiousness in certain specific stools (cholera, typhoid) after their exit from the body, which the germ theory does easily.

What proof have we as to the existence of germs in disease?

They are very few. (1.) The particulate nature of vaccine lymph; (2.) the spirillum in relapsing fever; (3.) bacteria and vibriones in 'braxy' or 'charbon' and 'malignant pustule;' (4.) 'psorospermiæ' in the 'pèbrine' of silkworms; and (5.) according to Klebs and Tommasi, the 'Baccillus malaria' in agues.

The proof that the solid particles in vaccine lymph are the active principles is twofold—(1.) By dilution, when it is found that the only change is in the increase of the number of unsuccessful inoculations, but there is no decrease of intensity when the poison *does* act; (2.) By diffusion, when it is found that the infection still remains in the deeper layer of the fluid.

It has been argued that the spirillum in relapsing fever is the result, not the cause, of the disease. Why then does it not occur in other fevers?

There is no doubt that 'charbon' and 'pèbrine' are due to germs, and this gives one strong ground for reasoning by analogy in man. These two diseases are uniformly fatal, all contagious fevers in men, however, are not. How is this? It is because the germs do not continue to multiply in the blood, but migrate into the tissues, where they give rise to the characteristic local lesion of the disease; they are, in fact, not only organisms, but parasites. Now, the distinguishing feature of a parasite is that it is propagated only in certain localities, often of very limited extent; therefore for the production of parasitic disease two factors are necessary—(1.) A parasite; (2.) a suitable nidus; and it is this second factor which causes many of the phenomena which, taken together, form apparently such a formidable array *against* the germ theory; such as the different degrees of severity, cessation of febrile symptoms, exhaustion of susceptibility, &c.

2. *Phenomena of the febrile state.*—Place side by side (1) the phenomena of the febrile state and (2) the vital characteristics of germs, and one sees how easily the former might be the outcome of the growth of the latter:—

| (1.) | (2.) |
|---|---|
| Increased nitrogenous waste. | Mainly composed of albumen. |
| Increased consumption of water. | They largely consume water. |
| Increased rapidity of circulation. | They largely consume nitrogen. |
| Preternatural heat. | They multiply by division. |
| Rapid wasting. | They live on their host. |

Increased waste of nitrogenous tissues is, according to Virchow, due to increased tissue change; but if this is true, there ought to be increased elimination of nitrogen, whereas in many cases (especially when fever runs high) there is decreased elimination. There are three explanations of this:—

1. The changes stop short of urea formation.

2. Urea is formed but retained. Considering that decreased elimination occurs in cases of high temperature, the oxidation ought to be *more* complete, and not *less* so. And, again, why should structurally sound kidneys fail to eliminate urea if it *is* formed ?

3. There is some other agency at work besides increased tissue change. Just such an agency is found in such an organism as the contagium particle is supposed to be, and it is the great consumption of nitrogen by it which causes the rapid wasting of the nitrogenous tissues; increased disintegration playing only a secondary part. The contagium particle seizes the constructive store-albumen on its way to the tissues, so that the wasting of the nitrogenous tissues is due to defective formation. Such being the case, the propagation of the contagium must cause rapid emaciation, unless the supply of pabulum be greatly increased, but this is impossible, for the impaired nutrition of the tissues generally leads (in the digestive organs) to impairment of function, whilst the great consumption of water leads to diminished quantity of the necessary secretions, and thus are produced diminished appetite, impaired digestion, and defective assimilation; the most essential constituents of the blood at the same time being everywhere seized upon at the moment when they are about to be appropriated by the tissues. Salkowski's observations as to the retention of soda salts during fever favour this view, for as soda salts exist chiefly in the serum of the blood, and this is the source from which the germs take up constructive store-albumen and water, the retention of soda is a necessary consequence of their growth. *As a rule,* however, in fevers there is *increased* elimination of urea. How is this if there is really decreased tissue formation? The consumption of nitrogen by the germs takes place chiefly in the minute structure of the tissues in and around the capillaries, so that the protoplasm of the germs and that of the tissues is formed and renewed at one and the same time. Now nutrition consists of two processes—(1) The taking up of new material and (2) the throwing off of old, both of which are contemporaneous. Whilst this simultaneous double action is going on, the germs step in and convert into their own protoplasm so much as they require of the constructive albumen. The formation of retrogressive albumen is equally far advanced; but as no such agency interferes to prevent its completion, this action continues as usual, just as though a normal amount of tissue formation were taking place.

Decreased elimination of urea in bad cases is due to the

immense consumption of water by the germs, so that there is not enough left to form urine in sufficient quantity.

*Thirst* is a very prominent symptom, and to allay this, huge draughts of water are taken; yet the amount of water eliminated is less than normal, the skin being hot and dry, the bowels confined, and the urine scanty. This cannot all be retained *as water* in the system. Parkes imagines that some hygroscopic substance is formed during fever, probably gelatinous in nature, and due to defective metamorphosis. There are two objections to this—(1.) Why should such defective metamorphosis exist? (2.) Can any gelatinous substance produce so great an absorption of water? On the other hand, the immense quantity absorbed by the growth of minute organisms easily explains this phenomenon.

*Increased frequency of circulation.*—Increased tissue change in any part causes increased flow of blood through it, and consequently, as the germs are all over the body, there is acceleration of the whole blood stream.

*Preternatural heat* is, by Virchow, considered to be due to changes in the nervous system. Whence these alterations? That the nervous system does play an important part in keeping up normal temperature is certain; that it is often deeply involved during fever is equally so, but it does not follow that all the phenomena of the febrile state result from it—in fact, it is more probably secondary. The growth and propagation of minute organisms in the body, and the changes both in themselves and also in the tissues of the host, are quite competent to explain this phenomenon.

In conclusion, the germ theory is by no means proven, but it certainly is one of the most plausible and most simple of all those relating to contagious fevers, and it explains easily many points that no other theory can adequately account for.

*December* 4.

*House Physicians' Evening.—Discussion on Intestinal Obstruction, introduced by Mr. Holland.*

The chief difficulty that intestinal obstruction presented was, he said, the diagnosis, and he recited from memory three cases illustrating this. One a case of peritonitis, in which it was found post-mortem that the cæcum, distended with gas and connected with a very long mesocæcum, had floated up into the left hypochondrium, and, doubling on itself, offered an effectual barrier to the passage of fæces. In another case, diagnosed as chronic peritonitis, it was found post-mortem that the obstruc-

tion was due to internal strangulation by an adhesion. In the third case, the appendix vermiformis was found ulcerated. Mr. Cripps recorded the case of a charwoman who had had a slowly increasing lump at her umbilicus for ten years past. She was subject to constipation and had never worn a truss. The hernia was irreducible, and contained hard lumps, probably of omentum. Her bowels acted last on 12th June. On the 20th she suffered from no discomfort, and ol. ricini was administered without effect. She had some pain, on and off, after this, and the skin over the tumour became dusky. On the morning of the 22d, when the patient seemed moribund, an operation was performed under chloroform. The sac was opened and an artificial anus imperfectly formed—imperfectly because the skin was sloughy and adhesions had formed. The slough extended, and was finally removed along with some omentum. She had an attack of erysipelas in the wound, from which she recovered. She died on the 15th July, having lived twenty-five days. The post-mortem showed that the opening had been made into the colon. Now, had no opening been made, the patient must have died much sooner, for there was found obstruction by fibrous bands much lower down in the gut.

Mr. Heath referred to the use of antiseptics in gastrotomy, and spoke of several cases of obstruction he had seen. One of impacted fæces, followed by chronic peritonitis, in which the patient recovered after the use of copious enemata. Another case was that of a boy who was accustomed to overeating, and after one such excess obstruction came on suddenly, and internal strangulation was diagnosed. Mr. Savory operated, and found a diverticular band causing the obstruction. Such bands were, he said, the commonest cause of obstruction in young people. In the case of another boy, general peritonitis was found post-mortem, but there was no cause apparent, though Mr. Heath thought that during life a coil of intestine could be felt through the anterior wall of the rectum.

Mr. Burn mentioned the case of a woman who gave a history of sudden pain followed by obstruction, and stated that previous to this her bowels had been evacuated regularly. Gastrotomy was performed and a malignant stricture found. An artificial anus was then made and the woman recovered.

He called attention to the unfairness of the parallel that had been drawn between ovariotomy and gastrotomy, for while in the former we could choose our patients and our time to operate, no such choice was permissible in gastrotomy.

Mr. Bruce Clarke referred to several cases he had seen; amongst others, that of a woman in whom obstruction was due

to impacted fæces in connection with an umbilical hernia. This obstruction was relieved by an enema of Oiij. of olive oil.

Another somewhat similar case died suddenly after partial relief by enemata.

In another case Mr. Savory performed abdominal section, but the patient died, and post-mortem a band was found strangulating the gut.

*December* 11.

Mr. Coates showed a specimen of battledore placenta from a case of placenta prævia.

Mr. Kendal read notes of a case of litholapaxy and lithotrity, in which Mr. Smith had removed at two sittings fourteen ounces of sand and stones.

Mr. Eve showed a specimen of encysted hydrocele of the cord.

Mr. Eve then read a paper on 'Circumscribed Necrosis of the Extremities of the Diaphyses and of Epiphyses of Growing Long Bones.'

The paper was profusely illustrated by specimens, most of which had been recently added to the Museum. The paper will be found in vol. xv. of the Hospital Reports, p. 129.

*January* 15, 1880.

This was the first meeting that the Society held in its new room.

Mr. Lockwood showed an aorta, the main branches of which were given off in an unusually abnormal manner.

Mr. Lockwood also showed a dissection showing that the posterior fasiculus of the external lateral ligament of the ankle-joint did not arise from the fossa at the lower end of the fibula, but from the apex of the lower extremity of the bone. He maintained that the ligament only occupied the fossa during plantar flexion of the foot.

Mr. King then read a paper on 'Medicine in its Relation to Physiology.'

This paper will be found printed *in extenso* in the 'Student's Journal' for March and April 1880.

*January* 22.

Mr. Moullin read a paper on the 'Uses of a Leucocyte.' He pointed out its paramount importance in normal and pathological processes, and thought that insufficient attention was paid to leucocytes, while the less active and unimportant elements

connective tissue, corpuscles, &c., had great consideration given them. Not only did we ourselves spring from a cell like a leucocyte, but all normal and morbid products were the work of leucocytes.

*January* 29.

Mr. Chalmers showed a baby with a meningocele the size of a walnut, situated over the posterior fontanelle.

Mr. Heath showed the heart and one lung from the body of a man who was crushed by the buffer of a locomotive engine. Beyond a few bruises there was no external injury, and the only damage done to the bony parts was a fracture of the left clavicle. The lung and liver were much lacerated and the heart was ruptured.

Dr. Steavenson read a paper on the 'Medical Act (1858) Amendment Bill.' This paper has been published as a pamphlet.

*February* 5.

*Medical Discussion on Hysteria, introduced by Dr. Ormerod.*

He called attention to the wideness of the subject, and, in a short speech, referred to the various theories as to its causation and its ever-varying clinical symptoms. It was not, as usually supposed, always found in women, but sometimes occurred in boys and young men. An animated discussion followed, turning chiefly on those points brought forward by Dr. Ormerod.

*February* 12.

Mr. Griffith showed a middle-aged man in both of whose arms the radius was apparently ankylosed to the ulnar in their upper portions. The hands could not be supinated, and were maintained in a position of nearly extreme pronation. The muscles were well developed, and he was capable of hard work. The defect was congenital, and one somewhat similar occurred in a brother.

Mr. Bowlby showed microscopic specimens of a tumour of the female breast, removed by Mr. Savory.

Mr. Heath showed a heart with great eccentric hypertrophy of the left ventricle consequent on aortic regurgitation secondary to atheroma of the aorta.

*February* 19.

Mr. Macready showed a macerated specimen of a fracture into the ankle-joint, in which both malleoli had been broken off.

Mr. Bowlby showed some microscopic sections of a cylindroma, removed by Mr. Willett from the popliteal space of a young man.

Mr. Gill read a paper on the 'Treatment of Acute Pneumonia.'

The subject of the paper was the treatment of acute idiopathic pneumonia: those forms of the disease which occurred secondarily to other diseases or as complications of it, being excluded, viz., pneumonia of typhus, small-pox, and pneumonia occurring in Bright's disease, disease of the heart, &c.

Acute idiopathic pneumonia is known by two signs — 1. Fever; 2. Pulmonary disturbance. Both of these vary in their intensity to a great degree. The exact relation of the one to the other is not known, viz., whether the morbid processes going on in the lung are the cause of the high temperature, or whether the changes in the lung are the expression of a general constitutional disturbance, of which the fever is the prominent sign; and the author is doubtful if the adoption of one or the other view would materially alter the treatment as at present carried out. He is of the opinion that the severity of an attack of acute (idiopathic) pneumonia is regulated by—1. The intensity of the inflammatory process; and, 2. The extent of lung involved in that process.

The nature of the morbid change was then fully discussed, and the aids derived from this study applied to treatment. The consolidated lung offers a barrier to the flow of blood through it; hence more blood is diverted into the normal portion of the same side, and into the opposite lung. The congested lung, in turn, impedes the circulation of blood through it, and as a consequence arterial tension is increased, and so the right side of the heart becomes weakened, because, in the first place, it has to force more blood through a smaller area of lung, and, secondly, from the gradually distended state of the pulmonary arteries, it is more or less encumbered in its action, not being able properly to empty itself.

Thus is explained the most important factor in causing cardiac debility in this disease; and thus also the high percentage of deaths from this cause (cardiac debility). To counteract this evil tendency, stimulants should be administered whenever the heart gives signs of flagging. These signs are rapidity of pulse, weakness of first sound, and irregularity of action. If alcohol is given, it should be given in the shape of brandy in small doses frequently administered, the amount being regulated by the strength of the pulse. If alcohol is not given,

carbonate of ammonia is very useful, out of camphor mixture or effervescing citrate of potash mixture; 5 grs. every four hours at first, and this afterwards reduced as strength of pulse increases. The author has observed cases do well both with and without alcohol, and strongly advises the early use of alcohol if the case is likely to prove a severe one, because alcohol has a steady stimulant action, whereas ammonia after some days begins to lose its effect.

Provided the pyrexia is not high, and dypsnœa not severe, the strength of the heart is to be maintained by judicious use of stimulants. But if the dypsnœa becomes grave, what can then be done? The cause of this grave symptom is the overloading of the right side of the heart; this can be overcome by blood-letting; but even this means is only temporary, and may have to be repeated three or more times; and, considering the loss of blood to the patient and the not very certain nature of the remedy, the practice of blood-letting in acute pneumonia is as a rule very dangerous. But are there no cases in which it may do good? Just about the time of the crisis (which is itself very uncertain with reference to day of attack), say fifth, seventh, ninth day, the heart may be greatly exhausted, and if it could be relieved for two or three hours, might entirely recover itself in the fresh conditions in which it is placed (after crisis). In these cases, which are special ones, but sometimes (much more often perhaps than is generally believed) present themselves to the observation of the practitioner, bleeding will do good. Generally, the author thinks it unwise to bleed before the fourth day. On that day and after, bleeding may be resorted to, and may have to be repeated. Four or five ounces should be taken at a time, or a little more if need be; but in all cases there should be unequivocal signs of insufficiency of the right heart, as the blood-letting is directed to relieve this unfavourable occurrence.

These means, then, viz., alcohol, carbonate of ammonia, blood-letting, the author uses for the weakness of the right heart—carbonate of ammonia in children and young people; alcohol in cases which are likely to be protracted; sometimes both alcohol and ammonia, especially if the patient has been but poorly fed before the attack or is naturally weakly. In these latter cases the use of the alcohol is seen in tending to prevent body-waste; blood-letting only in those special cases above mentioned.

But although impediment to the flow of blood through the pulmonary arteries is the most important factor in inducing cardiac weakness, it is not the only one.

The extent of lung surface is greatly diminished by the consolidated lung being impervious to air, the air vesicles being filled with inflammatory products. Hence the remaining normal portion becomes expanded (undergoes a compensative emphysema), to accommodate the increased amount of air now going to it. But even then the deficiency of air caused by inactivity of the inflamed lung is not made up by the excess absorbed by the enlargement of the normal lung; hence less amount of oxygen is absorbed into the system, and, as a consequence, nutrition is impaired. From this point of view the author believes that the air breathed by the patient should be as pure as possible. Ventilation of the room in which he is resident should be seen to, and a continual supply of fresh air ensured.

The third factor in causing cardiac insufficiency is the fever. The pyrexial state is well known to produce tissue waste, and, along with the other organs of the body, the heart suffers.

The fever in most cases of pneumonia does not require special treatment other than that of administering alcohol, which serves the double purpose of being a stimulant and antipyretic, in so far as it retards tissue waste. But if the fever is very high (temperature above 104·8° F.), some other means must be used; and the author is decidedly in favour of cold, either of the so-called ice-packing or the bath. If the latter is decided upon, care should be taken in removing the patient into it; and remembering the temporary slight shock which is caused by immersion of the patient, and also the temporary increase of cardiac action (caused by constriction of cutaneous capillaries), it may be well to administer a small quantity of wine or spirits before immersion, and also after it. The patient should be kept in the bath until the temperature in the rectum is down to normal or near it; he should then be placed between blankets for a few minutes and afterwards carefully dried. If a good result be obtained and the temperature again go up, another bath should be ordered, and so on; but if the result of the first bath be such as not to warrant a second one, ice-packing should be resorted to, and the patient placed in a cool room.

When a case of acute pneumonia comes before us, we should observe the condition of the pulse, the amount of the dyspnœa, and the general condition of the patient, and prescribe according to the treatment mentioned above. Plenty of nutritious food should be ordered; best in small quantities at frequent intervals, so that the stomach be not exhausted by being overloaded; and the bowels should be opened. The author generally gives, at first, ammon. carb., gr. v. ex. hst. pot. cit., and alcohol or not according to the general condition of the patient or the

intensity of the pneumonia. If the pneumonia proceeds without any bad symptoms arising, the treatment is continued; but if the heart begins to flag, or the dyspnœa assumes a grave character, then a change of treatment is necessary, as described above; if the fever runs high, this must be checked if possible.

In the stage of resolution some difficulty may be experienced in expectorating the viscid sputa. Infusion of senega is useful in overcoming this difficulty. (Sometimes the pneumonia runs its course without causing any expectoration, all the inflammatory products becoming absorbed, and in young children the sputa are swallowed.) When the stage of resolution is inordinately prolonged, then turpentine is good in exercising a stimulant action on this process. The sputa of acute pneumonia are very viscid, rusty coloured, and contain no air or very little; sometimes they are red from a slight hæmorrhage. This is very rarely of such proportions as to call for interference. When it should happen to be so, then perfect rest on the back, with an ice-bag to the sternum and ice in the mouth, are indicated. The prune-coloured sputa are said to foreshadow a fatal termination. Rarely the pneumonia goes on to abscess; here the patient is to be supported with brandy, food, ammonia, and bark, and the fœtor of the breath counteracted by the carbolic spray. So in the case of gangrene complicating pneumonia.

Not all cases of pneumonia terminate by crisis (and the occurrence of sweating predicates the near approach of the crisis); some end by lysis. In these latter instances the strength of the patient has to be maintained, and small doses of digitalis will be found useful, with quinine and other tonics, to promote recovery.

Before concluding, the author referred to the old treatment of pneumonia by depressants, tartar emetic, and other such-like drugs. He expressed his disapproval of these drugs in so far as their use is not based upon rational grounds. Thus it is very equivocal whether tartar emetic or any other depressant has any direct effect upon the inflamed lung, causing it to undergo resolution; and its undoubted weakening action on the heart is a contra-indication of the use of this drug. The author finally remarked that the tongue might be cleaned and appetite improved by the administration of a small quantity of strychnia and quinine after all fever has disappeared, and expressed a belief that the true method of treatment was to find out the changes which took place in disease and the corresponding clinical symptoms these changes gave rise to; and then to attack the cause in the first place, and, if this be not attainable, to palliate or remove, if possible, unfavourable symptoms.

*February 26.*

Mr. Dingley read a paper on 'Glaucoma.' He first described the morbid anatomy of the disease and then referred to some of the clinical symptoms, and discussed the various theories of its pathogeny.

Finally, he spoke of treatment, and, after mentioning other methods, gave it as his opinion that there was no treatment equal to that by iridectomy. He read notes of several cases of subacute and chronic glaucoma.

*March 4.*

*House Surgeons' Evening.—Discussion on Tracheotomy, introduced by Mr. Coles.*

Surgical cases, he considered, were much more favourable for operation than medical ones. Tracheotomy should never be performed on children under two years of age. The case should be carefully examined, the larngoscope being used when the diagnosis was doubtful. He should use anæsthetics unless the patient were moribund. He mentioned a method of performing the operation with the benzine cautery, but condemned it in consequence of its bad after-effects.

During the operation Siegel's steam-spray, and afterwards Dr. Lee's steam-kettle, should be used.

Mr. Lockwood would operate early, and would rather not give an anæsthetic. Sometimes there were difficulties in removing the tube; he should keep the temperature of the room about 70° F.

Mr. Day thought the difficulties of the operation had been exaggerated. He would operate early to give rest to the inflamed glottis and fauces. He was opposed to the use of anæsthetics, but preferred chloroform to any other. Finally, he advocated the use of special nurses in the after-treatment, instead of volunteer students.

Mr. Bruce Clarke divided the cases into acute and chronic. Under two years of age no patient should be operated on; after that age operation should always be performed to give the patient a chance, and in urgent cases he would operate early. In acute cases he would never give an anæsthetic, but would consider its administration optional in chronic ones.

Mr. Dingley said that during his year of office as House Surgeon there had been thirteen cases. He always made his incision as high as the thyroid cartillage. He liked to use a large silver tube for the first forty-eight hours, after which one of Baker's tubes should be introduced; and he suggested that

Baker's tubes might with advantage be stiffened with an inner coil of wire. In no case would he use an anæsthetic.

Mr. King thought that too much had been made of the difficulties of the operation. He attributed the high mortality in children to the fact of the operation having been generally delayed, and the production thereby of collapse of the lung.

He explained the production of atalectasis by the great ease with which air was expelled through the glottis during expiration, and the difficulty or impossibility of drawing any in during the inspiratory movements on account of the valve-like action of the swollen vocal cords. In a large number of cases of so-called œdema glottidis, he believed the real cause of the obstruction was spasm, which was so easily induced by the contact of cool air with the inflamed, and therefore abnormally irritable, laryngeal muscles. In illustration of this he cited two cases he had recently seen in the post-mortem room. He mentioned, as one of the incidents he had seen follow the operation, surgical emphysema. He attributed this to the incisions through the various layers of structures not having been made of equal length.

Mr. E. Clark thought the trachea should be opened and the tube inserted as quickly as possible, and at the end of an inspiration; he thought a respirator would be a useful adjunct to Baker's tubes.

Dr. Steavenson considered the mortality due to delay. At the Children's Hospital in Ormond Street the mortality was 70 per cent. He kept the temperature of the cot at about 60° F. Baker's tubes required renewing every six months. He narrated a case of dyspnœa in which he had been called upon to perform the operation. The dyspnœa was, however, suddenly and permanently relieved by unexpected parturition.

Mr. Hoskin referred to cases in which paralysis of the epiglottis occurred as an effect of tracheotomy.

Mr. Gill thought the dyspnœa was not often due to mechanical causes, and considered the operation of no use in the collapse of the early stage of diphtheria.

Mr. Griffith considered a hole in the roof of Baker's tubes an advantage. He would give no anæsthetic and would operate early.

*March* 11.

Mr. E. Clark showed a series of sphygmographic tracings, some of which illustrated the signs whereby the clotting of the contents of an aneurysm could be diagnosed by the reappearance of the secondary waves, which had been obliterated on the affected side by the pressure of the aneurysmal cavity.

Mr. Dingley read notes of a case in which a portion of clay

pipe (exhibited) had been lodged in the orbit for a considerable length of time, and had finally been discharged through the nose. The piece of pipe was an inch long.

Mr. King showed a patient suffering from atrophy and paralysis of the left serratus magnus and other isolated muscles, as well as of all those supplied by the left musculo-spiral nerve. He said the case was anomalous, the diagnosis resting between Couveilhier's paralysis, lead-palsy, and paralysis a frigore (of Duchesne).

Mr. Lockwood read notes of a case of stricture cured by internal urethrotomy, and he showed the urethrotome and bougies, and boule, and olivare.

Mr. Lockwood also showed microscopic sections of chancres and condylomata.

Mr. Heath read a paper on the 'Uses of Southey's Capillary Drainage Tubes.'

Mr. Heath first described the instruments, consisting of a fine trochar and cannula with shield, and capillary india-rubber tube, and demonstrated from models their mode of use. He then drew attention to the fact that Dr. Southey first introduced these instruments for draining the subcutaneous tissues in anasarca, but that afterwards he extended their use for tapping the chest and abdomen.

The general advantages claimed for their use in paracentesis were—

1. That they were less dangerous, and their use caused less pain to the patient.

2. Their size rendered them especially useful in country practice, as they could be always carried in the pocket-case, and be ready for use on emergency.

3. That the most nervous patient would readily submit to have them used, whereas an anæsthetic was often required with such patients if the aspirator or large trochar were employed.

Mr. Heath then discussed the use of these tubes under three headings:—

1. In paracentesis thoracis.

2. In paracentesis abdominis.

3. In drainage of the subcutaneous tissues in cases of anasarca, &c.

In the first class he detailed cases where they had been used with marked success, and where the patients made rapid recovery.

In the history of one patient, which he gave in full, where there had been rapid effusion, filling the chest, causing great distress, he stated that tapping had been performed, the cannula being left in for twenty-four hours; and several pints

of serous fluid having drained off, recovery in a few days followed. He also gave it as his opinion that the tubes might be used with safety whilst effusion was going on, and that in some cases they prevented further exudation; but even if they did not, no harm would result from the tapping.

Then he related cases where tapping and letting off a small quantity only of fluid had started reabsorption, and a cure was soon effected.

Comparing this mode of tapping with that by the aspirator, he gave reasons for thinking it the safer, and argued that it was more rational to let fluid off slowly from the chest, that had been gradually filling and causing collapse of the lung, than to take off suddenly from this organ pressure that had been accumulating for several days. In the latter case, he stated that the lung was far more likely to collapse partially or completely when aspiration was discontinued, than if the pressure were taken off gradually, and the lung allowed time to resume its natural size; newly formed blood-vessels on the pleura were very apt to be ruptured by the sudden letting off of the whole of the fluid contained in the pleural cavity, and that the lung was far less likely to be wounded by the cannula than by the aspirator; and mentioned a case where he had seen this accident occur when the aspirator with a pointed needle was used.

The tubes were found unsuitable for tapping in cases of empyæma, as pus would not run freely through them and they frequently became blocked. In several such cases, he stated, the tubes were tried, but the relief was so slow and the trouble of clearing them so great, that this mode of tapping was given up and other means adopted.

The trochars were generally inserted into the chest in the ordinary situation in the mid-axillary line, for convenience of arranging the india-rubber drainage-tube; but Mr. Heath thought they might with safety be inserted in almost any part of the chest, the situation of the great vessels excepted, even over the pericardium, when there was great distension of the sac. In paracentesis abdominis Mr. Heath recounted the dangers of the operation by the ordinary trochar, and stated that most of these, such as death from syncope or peritonitis, were altogether avoided; whilst others, such as wounding of a vessel or the intestines or non-closure of the wound, were very greatly diminished by the employment of the capillary tubes. Rapid refilling of the abdominal cavity, he stated, was much less likely to follow if it were slowly emptied whilst continual pressure was kept up; and he related cases where, after tapping by this means, no refilling had occurred, and the patients recovered.

In other cases where tapping had to be performed on more than one occasion, the patients also recovered. In one case the operation was performed fourteen times, and the patient eventually left the Hospital well enough to undertake the duties of a nurse. The average time that the tubes were left in was from eight to twelve hours, but in some cases they were allowed to remain in two or three days without any ill effects supervening. Mr. Heath believed that any part of the abdomen might with safety be punctured with the trochar; and that if the intestines did happen to be pricked, no harm would probably follow; but, as he pointed out, the length of the instrument would almost necessarily prevent any such accident. The diagnosis of obscure abdominal swellings might, as he showed, be greatly facilitated by these trochars, as cysta or tumours could be tapped, and some of their cells or contained fluid drawn off for microscopical examination. In illustration he related cases where a doubtful diagnosis had been cleared up by such means.

For the *drainage of subcutaneous tissues* Mr. Heath stated that their chief use in clinical practice would be found, and that for this purpose they were of the greatest value; for, as he showed, hitherto the only means of effecting this object had been by puncturing the œdematous part with a lancet and letting the fluid drain off into the bed. This, he maintained, was a very unscientific mode of treatment, and hence the great value of Dr. Southey's tubes in these cases, as they kept the bed dry, and thus prevented the painful eczema which the sodden bedclothes was apt to produce, whilst at the same time it gave great relief to the patient by diminishing the œdema and lessening the painful stretching of the skin. The most convenient points to insert the tubes in the lower extremities were said to be on the outer side of the foot, just above the external maleolus, and on the outer side of the thigh, just above the knee. These places were chosen because then there was no necessity to carry the drainage tubes over the legs so as to reach the receiving vessel by the side of the bed. Mr. Heath said that the softer the œdema the better the legs drained, and that the hard brawny legs drained much more slowly, but that they became softer after these tubes had been inserted for some time. The average amount of fluid that drained away in a day was from a pint and a half to two pints, but he had seen as much as four and a half pints in twenty-four hours from one leg, and seven and a half from both in an extreme case of dropsy. This fluid Mr. Heath proved to contain a large amount of urea, especially in cases of chronic Bright's disease, amounting, in some instances, to .2 to .4 gramme in one hundred cubic centimetres; and the amount of urea got rid of in this way was very considerable

In one case (the patient from whom seven and a half pints of fluid drained away from the legs in the day) the urea was found equal in amount to that passed in the urine (a pint and a half) during the same period. He also proved that peritoneal fluid in these cases also contains a considerable amount of urea, and pointed out that by the use of these tubes in the legs (and abdomen if necessary) the action of the kidneys may be materially aided.

From experience, he stated that the tubes might be left in from two to eight days, but should always be removed on the least sign of irritation being produced. As a means of preventing irritation, he dwelt strongly on the necessity of thoroughly cleansing the tubes before insertion by boiling them in carbolic acid solution (1 in 20) for a few minutes; and he said that if irritation did occur around the tube within a day or two after insertion, it was due to want of thorough cleansing before use. Mr. Heath had also used these tubes to diminish the sudden œdema produced by embolism of the brachial artery in a case of aortic disease, and several pints of serum had drained off in a few hours, with rapid disappearance of the very painful swelling. He concluded by relating the accidents, two in number, that he had seen happen from the use of these instruments. In one case, in the practice of a doctor in the neighbourhood of London, a cannula with a badly made shield, which allowed it to work out partially during respiration, broke off in the muscles of the chest. This, he said, was due to its being too much perforated. The broken piece was, however, easily removed. In the other case, an old cannula with a thread-worn screw was used for tapping the abdomen. It broke away from its shield and was lost in the peritoneal cavity. This accident, however, did not hasten the death of the patient; for though she died a few days later from her dropsy, at the post-mortem examination there was no sign of irritation around the cannula, which was discovered lying free in Douglas's space. Neither of these accidents, he stated, could have happened if properly constructed instruments, such as made by Arnold, had been used.

*March* 18.

Annual general meeting for the election of officers. The following was the result of the ballot:—Presidents, Mr. Coles, Mr. Heath; Vice-Presidents, Mr. Day, Mr. King; Treasurer, Mr. Savory; Hon. Secretaries, Mr. Herringham, Mr. Hoskin; Additional Committee-men, Mr. Berry, Mr. S. Paget.

DONALD D. DAY, DAVID A. KING } *late Hon. Secs.*

# EXAMINATIONS, 1877-78.

*Lawrence Scholarship and Gold Medal—*
M. PRICKETT.

*Brackenbury Medical Scholarship—*
S. S. BURN.

*Brackenbury Surgical Scholarship—*
A. DINGLEY.

*Senior Scholarship in Anatomy, Physiology, and Chemistry—*
D. A. KING.

*Open Scholarship in Science—*
W. A. HOYLE.
W. OVEREND.

*Preliminary Scientific Exhibition—*
P. S. ABRAHAM.

*Jeaffreson Exhibition—*
G. F. HERRINGHAM.

*Kirkes Gold Medal—*
C. A. D. CLARKE.

*Bentley Prize—*
T. W. H. GARSTANG.

*Hichens Prize—*
H. SMITH.

*Wix Prize—*
A. C. BULLER.

*Prox. accessit.*—D. A. KING.

## PRACTICAL ANATOMY.

SENIOR.

*Foster Prize*—W. T. WYATT.
2. D. D. DAY.
3. S. WESTCOTT.
4. W. J. COLLINS.
5. C. SANDARS. / E. RICE.
7. E. CLARKE. / J. HARPER.
9. R. JONES. / J. E. RISK.
11. G. T. HOCKIN.

JUNIOR.

*Treasurer's Prize*—C. L. H. TRIPP.
2. J. W. FIELD.
3. A. C. ROPER.
4. J. E. SQUARE.
5. B. RICE.
6. F. J. SHORT.
7. C. J. MURIEL. / T. MUDGE.
9. W. A. HOYLE.

# EXAMINATIONS, 1878-79.

*Lawrence Scholarship and Gold Medal—*
T. Kirsopp.

*Brackenbury Medical Scholarship—*
C. P. Lukis.

*Brackenbury Surgical Scholarship—*
H. W. T. Mudge.

*Senior Scholarship in Anatomy, Physiology, and Chemistry—*
D. D. Day.

*Junior Scholarships.—*
A. J. Anderson.
J. Berry.
S. Davies.

*Open Scholarships in Science—*
A. J. Anderson.
J. Berry.

*Preliminary Scientific Exhibition—*
J. R. Forrest, A. Hill, } Equal.

*Jeaffreson Exhibition—*
A. Shadwell.

*Kirkes Gold Medal—*
G. Barling, W. T. Wyatt, } Equal.

*Bentley Prize—*
Henry Smith.

*Hichens Prize—*
R. Jones.

*Wix Prize—*
R. Jones.

## PRACTICAL ANATOMY.

| Senior. | Junior. |
|---|---|
| *Foster Prize*—C. L. H. Tripp. | *Treasurer's Prize*—J. Berry. |
| 2. F. J. Short. | 2. F. J. Walker. |
| 3. W. A. Hoyle. | 3. C. J. Stansby. |
| 4. C. A. Morton. | 4. A. S. Nance. |
| 5. A. C. Roper. | 5. H. Rayner. |
| 6. E. G. Colville. A. T. G. Heath. | 6. A. W. Wheatley. |
| 8. F. W. Alexander. J. W. Field. C. A. James. | 7. R. W. Jalland. |
| | 8. J. Payne. |

# EXAMINATIONS, 1879-80.

*Lawrence Scholarship and Gold Medal—*
D. D. Day.

*Brackenbury Medical Scholarship—*
D. A. King.

*Brackenbury Surgical Scholarship—*
A. A. Bowlby.

*Senior Scholarship in Anatomy, Physiology, and Chemistry—*
A. J. Anderson.

*Junior Scholarships—*
T. W. Shore.
E. C. Pettifer.
F. Cresswell.

*Open Scholarships in Science—*
H. Lewis Jones.
T. W. Shore.

*Preliminary Scientific Exhibition—*
J. B. Nias.

*Jeaffreson Exhibition—*
A. Thistleton.

*Kirkes Gold Medal—*
D. D. Day.

*Bentley Prize—*
G. F. Herringham.

*Hichens Prize—*
J. R. Forrest.

*Wix Prize—*
A. C. Fletcher.

## PRACTICAL ANATOMY.

| Senior. | Junior. |
|---|---|
| *Foster Prize*—R. J. Collyns. | *Treasurer's Prize*—A. E. Hind. |
| 2. J. L. Stretton. | 2. T. W. Shore. |
| 3. H. Hendley. | 3. T. E. Lovegrove. |
| 4. F. J. Walker. | 4. C. O'B. Harding. |
| 5. J. Berry. | 5. A. M. Page. |
| 6. E. W. Roughton. J. Williams. S. Davies. | 6. J. F. Steedman. |
| 7. S. Pruen. | 7. S. Paget. |
| 8. M. Wright. | |
| 9. H. E. Bateman. | |
| 10. A. W. Wheatly. | |

# ST. BARTHOLOMEW'S HOSPITAL & COLLEGE.

## THE MEDICAL AND SURGICAL STAFF.

Consulting Physicians—Sir G. Burrows, Bart., D.C.L., F.R.S., Dr. Farre, Dr. Martin, Dr. Harris.

Consulting Surgeon—Sir J. Paget, Bart., D.C.L., LL.D., F.R.S.

Physicians—Dr. Andrew, Dr. Southey, Dr. Church, Dr. Gee.

Surgeons—Mr. Holden, Mr. Savory, F.R.S., Mr. Thomas Smith, Mr. Willett.

Assistant-Physicians — Dr. Duckworth, Dr. Hensley, Dr. Brunton, F.R.S., Dr. Wickham Legg.

Assistant-Surgeons — Mr. Langton, Mr. Morrant Baker, Mr. Marsh, Mr. Butlin.

Physician-Accoucheur—Dr. J. Matthews Duncan.

Assistant-Physician-Accoucheur—Dr. Godson.

Ophthalmic Surgeons—Mr. Power, Mr. Vernon.

Dental Surgeon—Mr. Coleman.

Assistant-Dental Surgeons—Mr. Lyons, Mr. Ewbank.

Administrator of Chloroform—Mr. Mills.

Casualty Physicians—Dr. V. D. Harris, Dr. J. A. Ormerod, Dr. S. West.

Medical Registrar—Dr. Champneys.

Surgical Registrars—Mr. Macready, Mr. Harrison Cripps.

## LECTURES.

Medicine—Dr. Andrew, Dr. Gee.

Clinical Medicine—Dr. Andrew, Dr. Southey, Dr. Church, Dr. Gee.

Surgery—Mr. Savory, F.R.S.

Clinical Surgery—Mr. Holden, Mr. Savory, F.R.S., Mr. Thomas Smith, Mr. Willett.

Descriptive and Surgical Anatomy — Mr. Langton, Mr. Marsh.

General Anatomy and Physiology—Mr. Morrant Baker.

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. Southey.

Public Health—Dr. Thorne.

Midwifery and the Diseases of Women and Children—Dr. Matthews Duncan.

Botany—Rev. George Henslow.

Pathological Anatomy—Dr. Wickham Legg.

Comparative Anatomy—Dr. Moore.

Ophthalmic Medicine and Surgery—Mr. Power.

Dental Anatomy and Surgery—Mr. Coleman.

Mental Diseases—Dr. Claye Shaw.

## DEMONSTRATIONS.

Morbid Anatomy—Dr. Moore.
Diseases of the Skin—Mr. Morrant Baker.
Orthopædic Surgery—Mr. Marsh.
Diseases of the Ear—
Diseases of the Eye—Mr. Vernon.
Practical Surgery—Mr. Butlin.
Practical Anatomy and Operative Surgery—Mr. Cumberbatch, Mr. Walsham.
Assistant Demonstrators—Mr. Bruce-Clarke, Mr. Edwards, Mr. Griffiths.
Mechanical and Natural Philosophy—Mr. Macalister.
Practical Physiology—Dr. V. D. Harris.
Assistant Demonstrator—Mr. D'Arcy Power.
Chemistry—Dr. Armstrong.
Medical Tutor—Dr. S. West.
Curator of the Museum—Mr. Eve.

## COLLEGIATE ESTABLISHMENT.

Warden—Dr. Norman Moore.

Students can reside within the Hospital walls, subject to the College regulations.

Ten Scholarships, varying in value from £20 to £100, are awarded annually.

Further information respecting Scholarships, Pupils' Appointments, and other details, may be obtained from Dr Norman Moore, and at the Museum or Library.

# STATISTICAL TABLES

OF THE

## Patients under Treatment

IN THE WARDS OF

# ST. BARTHOLOMEW'S HOSPITAL

## DURING 1879.

BY

THE MEDICAL REGISTRAR,

FRANCIS H. CHAMPNEYS, M.B. (Oxon.)—M.R.C.P.

AND

THE SURGICAL REGISTRARS,

J. MACREADY, F.R.C.S.

AND

W. HARRISON CRIPPS, F.R.C.S.

LONDON:

HARRISON AND SONS, ST. MARTIN'S LANE,

Printers in Ordinary to Her Majesty.

1880.

# PREFACE.

A new Medical Table, giving the effect of season on many of the principal diseases, has been added this year. No change has been made in the Surgical Tables.

# CONTENTS.

SURGICAL REPORT—

# ST. BARTHOLOMEW'S HOSPITAL.

## 1879.

| | |
|---|---|
| Number of Beds in Medical Wards (including 14 for Diseases of Women) | 230 |
| „ „ „ * Surgical „ {including 6 for Diseases of Women and 26 for Ophthalmic Cases} | 405 |
| „ „ „ Unassigned .... .... .... .. .... .. .... | 18 |
| | 653 |

### GENERAL STATEMENT OF THE PATIENTS UNDER TREATMENT DURING THE YEAR.

| | | | |
|---|---|---|---|
| Patients remaining January 1st, 1879 : | | | |
| Medical .... .... .... | 180 | .... 494 | |
| Surgical .. .... .... | 314 | | |
| Admitted during the year : | | | .... 6314 |
| Medical .... .... .. | 2380 | .... 5820 | |
| Surgical .... .... .... | 3440 | | |
| Discharged Cured and Relieved : | | | |
| Medical .... .... .... | 1763 | .... 4914 | |
| Surgical .... .... .... | 3151 | | |
| Discharged Unrelieved : | | | |
| Medical .... .... .... | 189 | .... 338 | |
| Surgical .... .... .... | 149 | | |
| Died : | | | .... 6314 |
| Medical .... .... .... | 412 | .... 586 | |
| Surgical .... .... .... | 174 | | |
| Remaining January 1st, 1880 : | | | |
| Medical .... .... .... | 196 | .... 476 | |
| Surgical .... .... .... | 280 | | |
| Patients brought in Dead .... .... .... .... | | 37 | |
| Number of Post-mortem Examinations ... .... | | 414 | |

* The number of Surgical Beds varied during the year.

# OCCUPATIONS OF MALE PATIENTS.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Accountants | .. | .. | 3 | Cabinetmakers | .. | 22 | Commission agents | .. 4 |
| Actors | .. | .. | 2 | Cabmen | .. | 24 | Commissionaire | .. 1 |
| Agents | .. | .. | 4 | Calico bleacher | .. | 1 | Compositors | .. .. 9 |
| Agricultural implement maker | .. | .. | 1 | Calico cutter | .. | 1 | Confectioners | .. .. 5 |
| Architect | .. | .. | 1 | Cane makers | .. | 2 | Constables | .. .. 4 |
| Artists | .. | .. | 2 | Canvasser | .. | 1 | Cooks | .. .. 2 |
| Asphalters | .. | .. | 2 | Cap maker | .. | 1 | Coopers | .. .. 7 |
| Bacon driers | .. | .. | 3 | Capsule makers | .. | 2 | Coppersmiths | .. .. 7 |
| Bag makers | .. | .. | 2 | Captains | .. | 3 | Corn chandlers | .. 2 |
| Bailiffs | .. | .. | 2 | Card maker | .. | 1 | Corn dealer | .. .. 1 |
| Bakers | .. | .. | 13 | Carmen | .. | 108 | Costermongers | .. .. 12 |
| Barber | .. | .. | 1 | Carpenters | .. | 56 | Cowkeeper | .. .. 1 |
| Bargemen | .. | .. | 3 | Carpet makers | .. | 2 | Cowman | .. .. 1 |
| Barmen | .. | .. | 15 | Carriers | .. | 2 | Cricketer | .. .. 1 |
| Basketmakers | .. | .. | 2 | Carters | .. | 2 | Crier | .. .. .. 1 |
| Bathmen | .. | .. | 2 | Cartridge maker | .. | 1 | Crossing-sweeper | .. 1 |
| Beadle | .. | .. | 1 | Carvers and gilders | .. | 10 | Curriers | .. .. 2 |
| Bell-hangers | .. | .. | 2 | Case maker | .. | 1 | Custom-house officer | .. 1 |
| Betting-man | .. | .. | 1 | Cashier | .. | 1 | Cutlers | .. .. 2 |
| Billiard markers | .. | | 3 | Cellarmen | .. | 6 | Dairymen | .. .. 2 |
| Bird stuffer | .. | .. | 1 | Cement makers | .. | 3 | Dealers | .. .. 2 |
| Blacksmiths | .. | .. | 9 | Chaff-cutter | .. | 1 | Decorators | .. .. 4 |
| Blind painter | .. | .. | 1 | Chair-caner | .. | 1 | Dispenser | .. .. 1 |
| Blue manufacturer | .. | | 1 | Chair-carter | .. | 1 | Distiller | .. .. 1 |
| Boatman | .. | .. | 1 | Chairmakers | .. | 8 | Dock labourers | .. 11 |
| Boiler makers | .. | .. | 2 | Cheesemongers | .. | 4 | Drapers | .. .. 4 |
| Bookbinders | .. | .. | 22 | Chemical worker | .. | 1 | Draughtsman | .. .. 1 |
| Book finisher | .. | .. | 1 | Chimney sweeps | .. | 4 | Draymen | .. .. 3 |
| Bookkeeper | .. | .. | 1 | Chocolate makers | .. | 3 | Dresser | .. .. 1 |
| Booking clerk | .. | .. | 1 | Cigar-box maker | .. | 1 | Drovers | .. .. 7 |
| Booksellers | .. | .. | 5 | Cigar makers | .. | 13 | Druggists | .. .. 4 |
| Boot finishers | .. | .. | 4 | Civil engineer | .. | 1 | Dustmen | .. .. 5 |
| Boot-laster | .. | .. | 1 | Civil servant | .. | 1 | Dyer | .. .. .. 1 |
| Bootmakers | .. | .. | 22 | Clerks | .. | 64 | Electro plater | .. .. 1 |
| Boot riveters | .. | .. | 4 | Clickers | .. | 3 | Emery maker | .. .. 1 |
| Bottle labellers | .. | | 2 | Clockmakers | .. | 5 | Engine drivers | .. 5 |
| Bottle merchants | .. | | 2 | Clothier | .. | 1 | Engineers | .. .. 37 |
| Bottle packer | .. | .. | 1 | Cloth worker | .. | 1 | Engine fitters | .. .. 3 |
| Box carriers | .. | .. | 3 | Club steward | .. | 1 | Engraver | .. .. 1 |
| Box makers | .. | .. | 2 | Coach liner | .. | 1 | Errand boys | .. .. 22 |
| Brace maker | .. | .. | 1 | Coachmakers | .. | 4 | Excavators | .. .. 2 |
| Brass finishers | .. | | 7 | Coachmen | .. | 12 | Factory hands | .. .. 3 |
| Brass founder | .. | .. | 1 | Coach painter | .. | 1 | Fancy-box makers | .. 2 |
| Brass moulder | .. | | 1 | Coal-dealer | .. | 1 | Farm bailiff | .. .. 1 |
| Brewers | .. | .. | 8 | Coalheavers | .. | 8 | Farmers | .. .. 2 |
| Brewery man | .. | .. | 1 | Coal porters | .. | 9 | Farm labourers | .. 11 |
| Bricklayers | .. | .. | 46 | Coastguard | .. | 1 | Farriers | .. .. 9 |
| Brickmakers | .. | .. | 4 | Coffee-house keepers | .. | 2 | Felt maker | .. .. 1 |
| Brokers | .. | .. | 2 | Coffee-stall keeper | .. | 1 | Fender maker | .. .. 1 |
| Brush makers | .. | .. | 5 | Collar maker | .. | 1 | Figure makers | .. .. 2 |
| Builders | .. | .. | 9 | Collectors | .. | 2 | Firemen | .. .. 5 |
| Butchers | .. | .. | 35 | Collier | .. | 1 | Firewood maker | .. 1 |
| Butlers | .. | .. | 2 | Colour grinder | .. | 1 | Fish curers | .. .. 2 |
| Button makers | .. | | 3 | Comedian | .. | 1 | Fishermen | .. .. 2 |
| | | | | Commercial travellers | . | 28 | Fishmongers | .. .. 7 |

# OCCUPATIONS OF MALE PATIENTS (*continued*).

| | | | | | |
|---|---|---|---|---|---|
| Fish porter | 1 | Hosier | 1 | Map mounter | 1 |
| Flower makers | 4 | House agent | 1 | Marble polishers | 3 |
| Flower-stand maker | 1 | Housebreaker | 1 | Marqueterie inlayer | 1 |
| Footmen | 7 | House decorators | 3 | Market gardeners | 2 |
| Foremen | 2 | Housekeeper | 1 | Masons | 9 |
| Founder | 1 | House-slater | 1 | Match maker | 1 |
| Foundrymen | 3 | Hydraulic pressman | 1 | Mat maker | 1 |
| Frame makers | 2 | Ice salesman | 1 | Meat examiner | 1 |
| French polishers | 11 | Indiarubber makers | 2 | Mechanics | 6 |
| Frisette maker | 1 | Innkeeper | 1 | Merchant | 1 |
| Furniture dealer | 1 | Instrument makers | 6 | Messengers | 5 |
| Furniture grainer | 1 | Insurance agent | 1 | Milkmen | 6 |
| Furnisher renewer | 1 | Iron founder | 1 | Miller | 1 |
| Furriers | 3 | Iron moulders | 3 | Mineral-water makers | 5 |
| Gamekeeper | 1 | Iron platers | 4 | Musicians | 2 |
| Gardeners | 21 | Ivory turners | 3 | Naval pensioner | 1 |
| Gas dealer | 1 | Japanner | 1 | Navvies | 3 |
| Gas engineers | 2 | Jam maker | 1 | Newsboy | 1 |
| Gas factors | 4 | Jewel-case maker | 1 | Newspaper editor | 1 |
| Gasfitters | 11 | Jewellers | 3 | Night porter | 1 |
| Gas stokers | 2 | Joiners | 6 | Night watchman | 1 |
| Gas workers | 2 | Jute worker | 1 | Office boy | 1 |
| Gatekeeper | 1 | Kitchen servant | 1 | Oilcake maker | 1 |
| Gelatine maker | 1 | Knife-cleaner | 1 | Oilcloth makers | 2 |
| General dealers | 5 | Labourers | 269 | Oil and colourmen | 4 |
| Gentleman | 1 | Lace maker | 1 | Omnibus conductors | 2 |
| Gingerbeer makers | 2 | Lamplighter | 1 | Omnibus drivers | 2 |
| Glassblowers | 4 | Last maker | 1 | Organ grinders | 3 |
| Glass cutters | 5 | Lath renders | 2 | Ostlers | 21 |
| Glass dealer | 1 | Laundryman | 1 | Overseer | 1 |
| Glass-shade maker | 1 | Law writers | 3 | Packers | 14 |
| Glass worker | 1 | Lawyer | 1 | Packing-case makers | 8 |
| Glass writer | 1 | Lead worker | 1 | Pages | 3 |
| Glazier | 1 | Leather-case makers | 7 | Paint-brush maker | 1 |
| Goldbeaters | 3 | Leather cutters | 2 | Painters | 30 |
| Gold and silver lace maker | 1 | Leather dealer | 1 | Paper colourers | 3 |
| Government Contractor | 1 | Leather dressers | 3 | Paperhangers | 3 |
| Grainer | 1 | Leather seller | 1 | Paper makers | 4 |
| Greengrocers | 14 | Leather workers | 3 | Paper marbler | 1 |
| Grinder | 1 | Ledger keeper | 1 | Paper ruler | 1 |
| Grocers | 7 | Lens maker | 1 | Paper stainers | 4 |
| Grooms | 12 | Letter-carriers | 3 | Paupers | 2 |
| Guards | 6 | Letter-sorter | 1 | Pavior | 1 |
| Gundealer | 1 | Liftmen | 2 | Pawnbrokers | 2 |
| Gunsmiths | 2 | Lightermen | 8 | Pedlars | 11 |
| Haddock-smokers | 2 | Linendrapers | 2 | Pensioner | 1 |
| Hairdressers | 5 | Linguist | 1 | Perfumers | 2 |
| Harmonium maker | 1 | Lithographers | 5 | Photographer | 1 |
| Harnessmakers | 6 | Lock-gateman | 1 | Pianoforte finisher | 1 |
| Hatter | 1 | Locksmiths | 3 | Pianoforte makers | 7 |
| Hawkers | 22 | Lodging-house keepers | 5 | Piano-key maker | 1 |
| Haybinder | 1 | Looking-glass maker | 1 | Piano-truss makers | 2 |
| Home Missionary | 1 | Lunatic attendant | 1 | Piano tuner | 1 |
| Hop picker | 1 | Machine boys | 3 | Picture cleaner | 1 |
| Horse dealers | 9 | Machine makers | 8 | Picture dealers | 2 |
| Horsehair dresser | 1 | Machine rulers | 5 | Picture-frame makers | 3 |
| Horsehair plaiters | 2 | Mail-cart drivers | 2 | Pig driver | 1 |
| Horse slaughterer | 1 | Mancipal in college | 1 | Pilot | 1 |
| | | Map maker | 1 | Pipe layer | 1 |

# OCCUPATIONS OF MALE PATIENTS (*continued*).

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pipe makers | 4 | Sheriff's officer | 1 | Ticket collectors | 2 |
| Plane maker | 1 | Ship builder | 1 | Tie cutter | 1 |
| Plasterers | 4 | Ship steward | 1 | Tinfoil workers | 8 |
| Platelayers | 3 | Shipwrights | 2 | Tinmen | 9 |
| Plumbers | 9 | Shoeblacks | 2 | Tin-plate workers | 4 |
| Policemen | 11 | Shoe finisher | 1 | Tobacconists | 3 |
| Polisher | 1 | Shoemakers | 38 | Tobacco-pipe maker | 1 |
| Pork butchers | 6 | Shop boys | 5 | Train conductor | 1 |
| Pork-pie maker | 1 | Shop fitter | 1 | Tramway conductor | 1 |
| Porters | 106 | Shopmen | 17 | Trimmer | 1 |
| Portmanteau makers | 2 | Shorthand writers | 2 | Turners | 9 |
| Postillion | 1 | Shroud maker | 1 | Typefounders | 7 |
| Postmen | 4 | Sieve maker | 1 | Umbrella framer | 1 |
| Post-office sorters | 7 | Signalmen | 3 | Umbrella makers | 8 |
| Potmen | 24 | Sign writer | 1 | Umbrella-stick maker | 1 |
| Poulterer | 1 | Silk spinners | 2 | Undertaker | 1 |
| Powder maker | 1 | Silk weavers | 2 | Upholsterers | 2 |
| Press cutter | 1 | Silversmiths | 3 | Valet | 1 |
| Printers | 56 | Silver polisher | 1 | Van boys | 8 |
| Printer's boy | 1 | Shirt printer | 1 | Van driver | 1 |
| Publicans | 6 | Slater | 1 | Van guards | 11 |
| Pugilist | 1 | Slaughterman | 1 | Varnish maker | 1 |
| Quill-pen cutter | 1 | Smiths | 8 | Vellum binder | 1 |
| Railway agent | 1 | Soap maker | 1 | Veneerer | 1 |
| Railway inspector | 1 | Soda-water maker | 1 | Verger | 1 |
| Railway porters | 4 | Soldiers | 10 | Vocalist | 1 |
| Railway shunter | 1 | Solicitor | 1 | Waiters | 23 |
| Railway signalmen | 2 | Spectacle maker | 1 | Walking-stick makers | 2 |
| Relieving officer | 1 | Spice baker | 1 | Warehousemen | 22 |
| Reporter | 1 | Splint maker | 1 | Warders | 3 |
| Rigger | 1 | Stablemen | 5 | Watchmakers | 5 |
| Riveters | 2 | Starch makers | 4 | Watchmen | 4 |
| Roller maker | 1 | Stationers | 3 | Water bailiff | 1 |
| Rope Spinner | 1 | Stay presser | 1 | Watermen | 5 |
| Ruler | 1 | Steam sawyer | 1 | Waterside labourer | 1 |
| Saddlers | 8 | Stereotypers | 2 | Weavers | 4 |
| Safe maker | 1 | Stevedores | 5 | Weeder | 1 |
| Sail maker | 1 | Stick dressers | 5 | Whalebone cutter | 1 |
| Sailors | 38 | Steward | 1 | Wheelwrights | 2 |
| Salesmen | 6 | Stokers | 12 | Wine agents | 2 |
| Sanitary inspector | 1 | Stone masons | 5 | Wine bottlers | 3 |
| Sawdust dealers | 2 | Storekeepers | 2 | Wine merchant | 1 |
| Sawyers | 14 | Strawcutter | 1 | Whipmounter | 1 |
| Scaffolders | 5 | Street musicians | 2 | White-lead carrier | 1 |
| Scale makers | 2 | Students | 18 | White-lead drier | 1 |
| Scavengers | 5 | Sugar chopper | 1 | White-lead grinders | 2 |
| Schoolboys | 299 | Surgeons | 2 | Wire drawers | 2 |
| Schoolmasters | 4 | Surgical-instrument makers | 2 | Wireworkers | 2 |
| Screw maker | 1 | Sweeps | 5 | Wood carvers | 4 |
| Scullion | 1 | Tailors | 37 | Wood choppers | 2 |
| Sculptor | 1 | Tallow chandlers | 2 | Wood cutters | 5 |
| Sealskin dressers | 2 | Tank maker | 1 | Wood turners | 3 |
| Searcher of records | 1 | Tanner | 1 | Wool picker | 1 |
| Secretary | 1 | Tea mixer | 1 | Wool sorter | 1 |
| Servants | 5 | Telegraph clerks | 4 | Wool worker | 1 |
| Sewermen | 2 | Telegraph-wire examiner | 1 | Writers | 3 |
| Sewing-machine maker | 1 | Thermometer maker | 1 | Zinc workers | 4 |
| Shepherds | 4 | | | | |

# OCCUPATIONS OF FEMALE PATIENTS.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Actresses | 4 | Errand girls | 2 | Match makers | 2 |
| Agent | 1 | Factory hand | 1 | Matrons | 2 |
| Artificial-flower makers | 16 | Fancy-box makers | 12 | Messenger | 1 |
| Artificial-leaf shader | 1 | Farmer | 1 | Midwife | 1 |
| Bakeress | 1 | Feather cleaners | 4 | Milkmaid | 1 |
| Bag makers | 6 | Feather curler | 1 | Milliners | 3 |
| Ballet girl | 1 | Feather sorter | 1 | Missionary | 1 |
| Barmaids | 21 | Feather worker | 1 | Musicians | 7 |
| Basket makers | 5 | Firewood maker | 1 | Music teacher | 1 |
| Biscuit packer | 1 | Fishmongers | 2 | Needlewomen | 30 |
| Bonnet makers | 7 | Fishwife | 1 | Net maker | 1 |
| Bookbinders | 3 | Flower sellers | 2 | Nurses (hospital) | 23 |
| Bookfolders | 16 | Frame maker | 1 | „ (monthly) | 14 |
| Bookkeeper | 1 | French polishers | 3 | „ (private) | 39 |
| Book sewer | 1 | Frilling makers | 3 | Nursery governess | 1 |
| Boot closers | 2 | Frisette maker | 1 | Office keepers | 2 |
| Boot fitters | 3 | Fruiterer | 1 | Oil maker | 1 |
| Boot makers | 6 | Fruit preserver | 1 | Old-clothes merchants | 3 |
| Boot trimmer | 1 | Fur cleaner | 1 | Oyster seller | 1 |
| Bottle washer | 1 | Furriers | 3 | Packers | 3 |
| Box labeller | 1 | Fur sewers | 3 | Paper-collar maker | 1 |
| Box makers | 12 | General dealer | 1 | Paper colourers | 4 |
| Brush makers | 5 | Gentlewoman | 1 | Paper glazer | 1 |
| Brush polisher | 1 | Goldbeater's-skin dresser | 1 | Paperhanger | 1 |
| Butcheress | 1 | Goldbeater's-skin maker | 1 | Paper sorter | 1 |
| Button-hole makers | 2 | Governesses | 6 | Percussion-cap maker | 1 |
| Button maker | 1 | Haberdasher | 1 | Pickler | 1 |
| Cabinet makers | 2 | Haddock curer | 1 | Playing-card cleaner | 1 |
| Cap maker | 1 | Hairworkers | 2 | Pocket-book maker | 1 |
| Cardboard liner | 1 | Harlots | 137 | Printer's reviser | 1 |
| Card maker | 1 | Hat makers | 2 | Probationers | 5 |
| Chair caners | 3 | Hawkers | 14 | Publican | 1 |
| Charwomen | 81 | Hop picker | 1 | Pupil teachers | 4 |
| China merchant | 1 | Horse clothier | 1 | Rag sorter | 1 |
| Cigar makers | 4 | Hosier | 1 | Sail makers | 2 |
| Cloth maker | 1 | Hotelkeeper | 1 | Saleswoman | 1 |
| Coffee-house keeper | 1 | Housekeepers | 13 | School girls | 302 |
| Coffee-stall keeper | 1 | Housewives | 610 | Schoolmistresses | 7 |
| Collar dresser | 1 | India-rubber worker | 1 | Scrubber | 1 |
| Collar cutter | 1 | Ironers | 14 | Scullery maid | 1 |
| Collar washer | 1 | Japanners | 2 | Sempstresses | 8 |
| Confectioners | 3 | Jewel-case maker | 1 | Servants | 294 |
| Cooks | 40 | Key turner | 1 | Sewing-machine maker | 1 |
| Dairywoman | 1 | Kilter | 1 | Shawl maker | 1 |
| Distiller | 1 | Label makers | 3 | Shoebinder | 1 |
| Doll maker | 1 | Lace maker | 1 | Shoe cleaner | 1 |
| Drapers | 7 | Lacquerer | 1 | Shoemakers | 2 |
| Dressmakers | 29 | Laundresses | 86 | Shopwomen | 16 |
| Dress-suspender maker | 1 | Lead workers | 2 | Shopkeepers | 3 |
| Dust sifter | 1 | Leather cutters | 2 | Silk weavers | 3 |
| Dyers | 3 | Lodging-house keepers | 3 | Silk winders | 8 |
| Elastic-stocking maker | 1 | Machinists | 48 | Silver burnisher | 1 |
| Embroideresses | 2 | Manglers | 5 | Sock maker | 1 |
| Embroidery maker | 1 | Mantle makers | 5 | Stationers | 2 |
| Envelope folders | 7 | Marine-store dealer | 1 | Stay makers | 6 |
| Envelope maker | 1 | Match-box makers | 3 | Straw-hat maker | 1 |

# OCCUPATIONS OF FEMALE PATIENTS (*continued*).

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Straw plaiters | .. | 2 | Tooth-brush drawers | .. | 3 | Waterproofer | .. | 1 |
| Swimming teacher | .. | 1 | Trimming makers | .. | 6 | Wax-taper maker | .. | 1 |
| Tailoresses | .. | 21 | Turpentine maker | .. | 1 | Weaver | .. | 1 |
| Tea-stall keeper | .. | 1 | Umbrella makers | .. | 5 | White-lead carriers | .. | 12 |
| Teachers | .. | 3 | Upholstresses | .. | 3 | White-lead dresser | .. | 1 |
| Telegraphist | .. | 1 | Valentine maker | .. | 1 | Wire maker | .. | 1 |
| Tent maker | .. | 1 | Vocalist | .. | 1 | Wool cleaners | .. | 2 |
| Tie makers | .. | 8 | Waistcoat makers | .. | 5 | Wool sorter | .. | 1 |
| Tinplate worker | .. | 1 | Waitresses | .. | 5 | Wood choppers | .. | 3 |
| Tobacconists | .. | 4 | Ward maids | .. | 7 | Worsted winder | .. | 1 |

# MEDICAL REPORT.

# TABLE I.

*Showing the Total Number of Completed Cases of each Disease under Treatment during the Year* 1879, *with the Results.*

(The numbers after the names of the Diseases refer to the Appendix at the end of the Table.)

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **GENERAL DISEASES, A.** | | | | | | | | | | |
| Small Pox (1) | 2 | 1 | .. | .. | 2 | .. | .. | **1** | .. | .. |
| Chicken Pox | 1 | 2 | 1 | 2 | .. | .. | .. | .. | .. | .. |
| Measles (2) | 13 | 16 | 12 | 13 | .. | .. | **1** | **3** | .. | .. |
| Sequelæ of Measles | 2 | 2 | 2 | 2 | .. | .. | .. | .. | .. | .. |
| Scarlet Fever (3) | 33 | 32 | 30 | 29 | .. | .. | **3** | **3** | .. | .. |
| Sequelæ of Scarlet Fever (4) | 21 | 20 | 18 | 18 | .. | .. | **3** | **2** | .. | .. |
| Typhus | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Enteric Fever (5) | 63 | 40 | 53 | 31 | .. | .. | **10** | **9** | .. | .. |
| Sequelæ of Enteric Fever | 2 | 2 | 2 | 2 | .. | .. | .. | .. | .. | .. |
| Febricula (6) | 9 | 13 | 9 | 13 | .. | .. | .. | .. | .. | .. |
| Ague (7)— | | | | | | | | | | |
| Tertian | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Quotidian | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Irregular | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Sequelæ of Ague | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Diphtheria (8) | 6 | 8 | 2 | 3 | .. | .. | **4** | **5** | .. | .. |
| Sequelæ of Diphtheria | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Hooping-cough (9) | 9 | 6 | 7 | 4 | .. | .. | **2** | **2** | .. | .. |
| Mumps | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Puerperal Fever (10) | .. | 7 | .. | 1 | .. | .. | .. | **6** | .. | .. |
| | 167 | 150 | 142 | 119 | 2 | .. | **23** | **31** | .. | .. |
| **GENERAL DISEASES, B.** | | | | | | | | | | |
| Rheumatism— | | | | | | | | | | |
| Acute (11) | 71 | 72 | 71 | 68 | .. | .. | .. | **4** | .. | .. |
| Subacute (12) | 12 | 16 | 12 | 16 | .. | .. | .. | .. | .. | .. |
| Gonorrhœal (13) | 11 | .. | 11 | .. | .. | .. | .. | .. | .. | .. |
| Synovial | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Muscular | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Lumbago | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Chronic (14) | 10 | 18 | 10 | 18 | .. | .. | .. | .. | .. | .. |
| Gout— | | | | | | | | | | |
| Acute | 3 | 1 | 3 | 1 | .. | .. | .. | .. | .. | .. |
| Chronic (15) | 8 | 3 | 8 | 3 | .. | .. | .. | .. | .. | .. |
| Chronic Osteo-arthritis | 2 | 3 | 2 | 3 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **GENERAL DISEASES, B (*continued*).** | | | | | | | | | | |
| Cancer— | | | | | | | | | | |
| Pericardium [16] | 1 | 1 | .. | .. | .. | .. | **1** | **1** | .. | .. |
| of Larynx | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| of Mediastinum [17] | .. | 1 | .. | .. | .. | .. | .. | **1** | .. | .. |
| of Abdomen [18] | 1 | 4 | .. | .. | .. | 1 | **1** | **3** | .. | .. |
| of Œsophagus [19] | 4 | .. | .. | .. | .. | .. | **4** | .. | .. | .. |
| of Stomach [20] | 1 | 5 | .. | .. | .. | 3 | **1** | **2** | .. | .. |
| of Liver [21] | 2 | 3 | .. | .. | .. | 1 | **2** | **2** | .. | .. |
| of Gall-bladder [22] | .. | 1 | .. | .. | .. | .. | .. | **1** | .. | .. |
| of Pancreas [23] | 1 | 1 | .. | .. | .. | .. | **1** | **1** | .. | .. |
| of Rectum [24] | 2 | .. | .. | .. | .. | .. | **2** | .. | .. | .. |
| of Kidney [25] | .. | 1 | .. | .. | .. | .. | .. | **1** | .. | .. |
| of Pelvis [26] | .. | 4 | .. | .. | .. | 4 | .. | .. | .. | .. |
| of Uterus [27] | .. | 25 | .. | .. | .. | 23 | .. | **2** | .. | .. |
| of Vagina | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| of Neck [28] | 1 | .. | .. | .. | .. | .. | **1** | .. | .. | .. |
| of Bone [29] | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| Epithelioma— | | | | | | | | | | |
| of Cervix Uteri | .. | 6 | .. | 5 | .. | 1 | .. | .. | .. | .. |
| of Vulva | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Lupus [30] | .. | 4 | .. | 4 | .. | .. | .. | .. | .. | .. |
| Scrofula | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Local Scrofulous Affections— | | | | | | | | | | |
| Tubercular Meningitis [31] | 4 | 2 | .. | .. | .. | .. | **4** | **2** | .. | .. |
| Phthisis Pulmonalis [32] | 41 | 46 | 20 | 25 | 1 | 5 | **20** | **16** | .. | .. |
| Acute Miliary Tuberculosis [33] | 3 | 6 | .. | 1 | .. | 1 | **3** | **4** | .. | .. |
| Tabes Mesenterica [34] | 1 | 1 | .. | .. | .. | .. | **1** | **1** | .. | .. |
| Tubercular Peritonitis [35] | 1 | 1 | 1 | .. | .. | .. | .. | **1** | .. | .. |
| Rickets [36] | 2 | 1 | 1 | 1 | .. | .. | **1** | .. | .. | .. |
| Cretinism | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| Diabetes [37] | 9 | 6 | 5 | 4 | .. | .. | **4** | **2** | .. | .. |
| Purpura— | | | | | | | | | | |
| Simple | 2 | .. | 1 | .. | .. | .. | **1** | .. | .. | .. |
| Hæmorrhagic | .. | 5 | .. | 3 | .. | 1 | .. | **1** | .. | .. |
| Scurvy | 2 | .. | 2 | .. | .. | .. | .. | . | .. | .. |
| *Anæmia | 2 | 17 | 2 | 17 | .. | .. | .. | .. | .. | .. |
| Chlorosis [38] | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| *General Dropsy | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| | 202 | 261 | 153 | 174 | 2 | 42 | **47** | **45** | .. | .. |
| **LOCAL DISEASES.** | | | | | | | | | | |
| DISEASES OF THE NERVOUS SYSTEM. | | | | | | | | | | |
| Diseases of the Brain and its Membranes. | | | | | | | | | | |
| Encephelitis | .. | 2 | .. | .. | .. | .. | .. | **2** | .. | .. |
| Meningitis [39] | 10 | 5 | 4 | 1 | .. | .. | **6** | **4** | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE NERVOUS SYSTEM (*continued*).** | | | | | | | | | | |
| Abscess (40) | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. |
| Apoplexy— | | | | | | | | | | |
| Sanguineous (41) | 11 | .. | 1 | .. | .. | .. | 10 | .. | .. | .. |
| Chronic Hydrocephalus (42) | .. | 2 | .. | .. | .. | 1 | .. | | .. | .. |
| Tumour (43) | 3 | .. | 2 | .. | 1 | .. | .. | .. | .. | .. |
| Cerebral Affection | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| **DISEASES OF THE SPINAL CORD AND ITS MEMBRANES.** | | | | | | | | | | |
| Inflammation— | | | | | | | | | | |
| Myelitis (44) | 4 | 1 | 2 | .. | .. | .. | 2 | | .. | .. |
| **DISEASES OF THE NERVES.** | | | | | | | | | | |
| *Paralysis— | | | | | | | | | | |
| Hemiplegia (45) | 28 | 20 | 25 | 14 | 3 | 6 | .. | .. | .. | .. |
| Paraplegia (46) | 9 | 4 | 7 | 3 | 2 | 1 | .. | .. | .. | .. |
| Locomotor Ataxy | 4 | .. | 4 | .. | .. | .. | .. | .. | .. | .. |
| Infantile Paralysis (47) | 4 | 1 | .. | .. | 4 | 1 | .. | .. | .. | .. |
| Local Paralysis— | | | | | | | | | | |
| Facial Paralysis | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Other Paralyses (48) | 3 | 2 | 3 | 2 | .. | .. | .. | .. | .. | .. |
| **FUNCTIONAL DISEASES OF THE NERVOUS SYSTEM.** | | | | | | | | | | |
| *Infantile Convulsions | 2 | 1 | 1 | .. | .. | 1 | 1 | .. | .. | .. |
| Epilepsy (49) | 13 | 17 | 11 | 15 | 1 | 2 | 1 | .. | .. | .. |
| Epileptic Vertigo | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| *Convulsions | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| Spasm of Muscles (50) | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Paralysis Agitans | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Chorea (51) | 11 | 33 | 9 | 31 | 2 | 1 | .. | 1 | .. | .. |
| Hysteria (52) | 1 | 36 | 1 | 32 | .. | 4 | .. | .. | .. | .. |
| Hysterical Paralysis (53) | .. | 4 | .. | 2 | .. | 2 | .. | .. | .. | .. |
| Neuralgia— | | | | | | | | | | |
| Various | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| Brow Ague | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Sciatica | 3 | 2 | 3 | 2 | .. | .. | .. | .. | .. | .. |
| Pleurodynia | .. | 5 | .. | 5 | .. | .. | .. | .. | .. | .. |
| Hypochondriasis | 3 | .. | 2 | .. | 1 | .. | .. | .. | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE NERVOUS SYSTEM (*continued*).** | | | | | | | | | | |
| Various Nerve Disorders (54) .. | 13 | 9 | 6 | 5 | 7 | 3 | .. | 1 | .. | .. |
| DISORDERS OF THE INTELLECT. | | | | | | | | | | |
| Mania .. .. .. .. | 1 | 2 | .. | .. | 1 | 2 | .. | .. | .. | .. |
| Melancholia .. .. .. | 1 | 3 | .. | .. | 1 | 3 | .. | .. | .. | .. |
| Dementia .. .. .. | 1 | 4 | .. | .. | 1 | 4 | .. | .. | .. | .. |
| | 137 | 157 | 93 | 115 | 24 | 31 | **20** | **11** | .. | .. |
| **DISEASES OF THE CIRCULATORY SYSTEM.** | | | | | | | | | | |
| DISEASES OF THE HEART AND ITS MEMBRANES. | | | | | | | | | | |
| *Diseases of the Pericardium.* | | | | | | | | | | |
| Pericarditis (55) .. .. .. | 6 | 4 | 6 | .. | .. | .. | .. | **4** | .. | .. |
| Adherent Pericardium .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| *Diseases of the Endocardium.* | | | | | | | | | | |
| Valve Disease (56)— | | | | | | | | | | |
| 1. Aortic .. .. .. .. | 16 | 5 | 10 | 5 | .. | .. | **6** | .. | .. | .. |
| 2. Mitral .. .. .. .. | 23 | 45 | 14 | 33 | 1 | .. | **8** | **12** | .. | .. |
| 3. Tricuspid .. .. .. | 1 | 1 | .. | .. | .. | .. | **1** | **1** | .. | .. |
| 4. Complicated .. .. .. | 13 | 9 | 8 | 7 | .. | .. | **5** | **2** | .. | .. |
| 5. Congenital .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| *Diseases of the Muscular Structure of the Heart.* | | | | | | | | | | |
| Dilatation (57) .. .. .. | 2 | 1 | 1 | 1 | .. | .. | **1** | .. | .. | .. |
| Fatty Degeneration (58) .. .. | 1 | 2 | .. | 1 | .. | .. | **1** | **1** | .. | .. |
| *Angina Pectoris .. .. .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| DISEASES OF THE BLOOD VESSELS. | | | | | | | | | | |
| *Diseases of the Arteries.* | | | | | | | | | | |
| Fibrosis .. .. .. .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| Aneurism— | | | | | | | | | | |
| of Aorta (59) .. .. .. | 12 | 3 | 6 | 1 | .. | .. | **6** | **2** | .. | .. |
| of Innominate .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Rupture (60).. .. .. .. | 1 | .. | .. | .. | .. | .. | **1** | .. | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE BLOOD VESSELS (*continued*). | | | | | | | | | | |
| *Diseases of the Veins.* | | | | | | | | | | |
| Phlebitis (61) | 1 | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. |
| Phlegmasia dolens (62) | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Obstruction (63) | 3 | 4 | 3 | 2 | .. | .. | .. | 2 | .. | .. |
| | 81 | 80 | 51 | 54 | 1 | 1 | 29 | 25 | .. | .. |
| DISEASES OF THE ABSORBENT SYSTEM. | | | | | | | | | | |
| Hypertrophy of Glands (64) | 3 | 4 | 1 | 3 | 1 | 1 | 1 | .. | .. | .. |
| | 3 | 4 | 1 | 3 | 1 | 1 | 1 | .. | .. | .. |
| DISEASES OF DUCTLESS GLANDS. | | | | | | | | | | |
| DISEASES OF THE THYROID GLAND. | | | | | | | | | | |
| Hypertrophy | .. | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. |
| Exophthalmic Bronchocele | .. | 9 | .. | 1 | .. | 7 | .. | | .. | .. |
| DISEASES OF THE SUPRA-RENAL CAPSULES. | | | | | | | | | | |
| Addison's Disease (66) | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| | 1 | 11 | .. | 2 | .. | 8 | 1 | 1 | .. | .. |
| DISEASES OF THE RESPIRATORY SYSTEM. | | | | | | | | | | |
| DISEASES OF THE RESPIRATORY SYSTEM NOT SIMPLY LOCAL. | | | | | | | | | | |
| Croup | 5 | 3 | 2 | .. | .. | .. | 3 | 3 | .. | .. |
| DISEASES OF THE LARYNX. | | | | | | | | | | |
| Laryngeal Catarrh | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Laryngitis— | | | | | | | | | | |
| Acute | 3 | 4 | 2 | 2 | .. | .. | 1 | 2 | .. | .. |
| Chronic | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| DISEASES OF THE TRACHEA AND BRONCHI. | | | | | | | | | | |
| Bronchial Catarrh | 10 | 15 | 9 | 15 | .. | .. | 1 | .. | .. | .. |
| Bronchitis— | | | | | | | | | | |
| Acute (67) | 14 | 15 | 12 | 12 | .. | .. | 2 | 3 | .. | .. |
| Chronic (68) | 43 | 45 | 30 | 34 | 3 | .. | 10 | 11 | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE RESPIRATORY SYSTEM (*continued*).** | | | | | | | | | | |
| DISEASES OF THE TRACHEA AND BRONCHI (*continued*). | | | | | | | | | | |
| Asthma .. .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| DISEASES OF THE LUNG. | | | | | | | | | | |
| Pneumonia (69) .. .. .. | 62 | 25 | 51 | 22 | .. | .. | **11** | **3** | .. | .. |
| Lobular .. .. .. | 2 | 2 | 1 | .. | 1 | .. | .. | **2** | .. | .. |
| Pleuro-Pneumonia (70) .. .. | 18 | 6 | 14 | 5 | .. | .. | **4** | **1** | .. | .. |
| Gangrene (71) .. .. .. | 1 | .. | .. | .. | .. | .. | **1** | .. | .. | .. |
| *Hæmoptysis .. .. .. | 8 | 2 | 7 | 2 | .. | .. | **1** | .. | .. | .. |
| Cirrhosis (72) .. .. .. .. | 1 | 1 | .. | .. | .. | .. | **1** | **1** | .. | .. |
| Emphysema (73) .. .. .. | 5 | 7 | 1 | 1 | .. | .. | **4** | **6** | .. | .. |
| *Collapse (74) .. .. .. | .. | 1 | .. | .. | .. | .. | .. | **1** | .. | .. |
| DISEASES OF THE PLEURA. | | | | | | | | | | |
| Pleurisy (75) .. .. .. .. | 38 | 20 | 32 | 16 | .. | .. | **6** | **4** | .. | .. |
| Sequelæ of Pleurisy (76) .. .. | 2 | 2 | 2 | 2 | .. | .. | .. | .. | .. | .. |
| Empyema (77) .. .. .. | 6 | 2 | 3 | 2 | .. | .. | **3** | .. | .. | .. |
| DISEASES OF THE MEDIASTINUM. | | | | | | | | | | |
| Tumour (78) .. .. .. .. | 4 | 1 | .. | .. | 3 | 1 | **1** | .. | .. | .. |
| | 223 | 152 | 167 | 114 | 7 | 1 | **49** | **37** | .. | .. |
| **DISEASES OF THE DIGESTIVE SYSTEM.** | | | | | | | | | | |
| DISEASES OF THE ÆSOPHAGUS. | | | | | | | | | | |
| *Stricture .. .. .. .. | 1 | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. |
| Dysphagia .. .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| DISEASES OF THE STOMACH. | | | | | | | | | | |
| Gastritis (79) .. .. .. .. | 5 | 3 | 5 | 2 | .. | 1 | .. | .. | .. | .. |
| Chronic Ulcer (80) .. .. .. | 2 | 6 | 1 | 5 | .. | .. | **1** | **1** | .. | .. |
| *Hæmatemesis .. .. .. | 4 | 2 | 4 | 2 | .. | .. | .. | .. | .. | .. |
| *Stricture .. .. .. .. | 1 | .. | 1 | .. | .. | . | .. | .. | .. | .. |
| Dyspepsia .. .. .. .. | 6 | 17 | 6 | 17 | .. | .. | .. | .. | .. | .. |
| *Vomiting .. .. .. | 1 | 3 | 1 | 3 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE DIGESTIVE SYSTEM (*continued*).** | | | | | | | | | | |
| DISEASES OF THE INTESTINES. | | | | | | | | | | |
| Enteritis | 2 | 3 | 2 | 3 | .. | .. | .. | .. | .. | .. |
| Typhlitis (81) | 2 | 1 | 2 | .. | .. | .. | .. | 1 | .. | .. |
| Dysentery (82) | 1 | 2 | 1 | .. | .. | 1 | .. | 1 | .. | .. |
| Ulceration (83) | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Perforation (84) | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Inflammation of the Subperitoneal Tissue | 3 | 2 | 3 | 2 | .. | .. | .. | .. | .. | .. |
| Melæna | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| *Tympanites | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| *Obstruction | 3 | 1 | 3 | .. | .. | .. | .. | 1 | .. | .. |
| Internal Strangulation (85) | 2 | 1 | .. | .. | .. | .. | 2 | 1 | .. | .. |
| Diarrhœa | 3 | 6 | 3 | 6 | .. | .. | .. | .. | .. | .. |
| Colic | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Constipation | 5 | 11 | 5 | 11 | .. | .. | .. | .. | .. | .. |
| Diarrhœa and Vomiting (86) | .. | 4 | .. | 3 | .. | .. | .. | 1 | .. | .. |
| DISEASES OF THE LIVER. | | | | | | | | | | |
| Hepatitis | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Abscess (87) | 4 | .. | 2 | .. | .. | .. | 2 | .. | .. | .. |
| Cirrhosis (88) | 11 | 8 | 5 | 7 | .. | .. | 6 | 1 | .. | .. |
| Lardaceous Liver (89) | 2 | .. | .. | .. | 1 | .. | 1 | .. | .. | .. |
| Parasitic Disease— Echinococcus Hominis (90) | 2 | 3 | .. | | 1 | 2 | 1 | 1 | .. | .. |
| Jaundice (91) | 7 | 7 | 6 | 6 | .. | 1 | 1 | .. | .. | .. |
| Enlargement | 1 | 2 | .. | 1 | 1 | 1 | .. | .. | .. | .. |
| DISEASES OF THE HEPATIC DUCTS AND GALL BLADDER. | | | | | | | | | | |
| Perforation (92) | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. |
| Gall Stones | 1 | 3 | 1 | 3 | .. | .. | .. | .. | .. | .. |
| DISEASES OF THE SPLEEN. | | | | | | | | | | |
| Hypertrophy (93) | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| Leucocythæmia (94) | 1 | 2 | .. | .. | .. | 1 | 1 | 1 | .. | .. |
| DISEASES OF THE PERITONEUM. | | | | | | | | | | |
| Peritonitis (95) | 8 | 9 | 4 | 5 | .. | .. | 4 | 4 | .. | .. |
| *Ascites (96) | 4 | 4 | 3 | 2 | .. | 2 | 1 | .. | .. | .. |
| Tumours (97) | 6 | 17 | .. | 3 | 6 | 14 | .. | .. | .. | .. |
| | 95 | 120 | 63 | 82 | 10 | 24 | 22 | 14 | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE URINARY SYSTEM.** | | | | | | | | | | |
| DISEASES OF THE KIDNEY. | | | | | | | | | | |
| Bright's Disease— | | | | | | | | | | |
| 1. Acute [98] .. .. .. | 14 | 6 | 10 | 5 | .. | .. | **4** | **1** | .. | .. |
| 2. Chronic [99] .. .. .. | 43 | 43 | 22 | 23 | 3 | .. | **18** | **20** | .. | .. |
| Abscess [100] .. .. .. .. | .. | 1 | .. | .. | .. | .. | .. | **1** | .. | .. |
| Pyelitis .. .. .. .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Calculus .. .. .. .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| *Hæmaturia Renalis [101] .. .. | 7 | 1 | 7 | 1 | .. | .. | .. | .. | .. | .. |
| *Hæmatinuria .. .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| *Diuresis [102] .. .. .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| DISEASES OF THE BLADDER. | | | | | | | | | | |
| *Hæmaturia (Vesical) .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| | 71 | 53 | 46 | 31 | 3 | .. | **22** | **22** | .. | .. |
| **DISEASES OF THE GENERATIVE SYSTEM.** | | | | | | | | | | |
| DISEASES OF THE FEMALE ORGANS OF GENERATION IN THE UNIMPREGNATED STATE. | | | | | | | | | | |
| DISEASES OF THE OVARY. | | | | | | | | | | |
| Inflammation [103] .. .. .. | .. | 16 | .. | 16 | .. | .. | .. | .. | .. | .. |
| Abscess [104] .. .. .. .. | .. | 1 | .. | .. | .. | .. | .. | **1** | .. | .. |
| DISEASES OF THE BROAD LIGAMENT. | | | | | | | | | | |
| Inflammation— | | | | | | | | | | |
| Pelvic Peritonitis [105] .. .. | .. | 21 | .. | 20 | .. | .. | .. | **1** | .. | .. |
| Pelvic Cellulitis [106] .. .. | .. | 12 | .. | 11 | .. | .. | .. | **1** | .. | .. |
| Abscess [107] .. .. .. .. | .. | 8 | .. | 7 | .. | .. | .. | **1** | .. | .. |
| Pelvic Hæmatocele .. .. .. | .. | 9 | .. | 8 | .. | .. | .. | **1** | .. | .. |
| DISEASES OF THE UTERUS, INCLUDING THE CERVIX. | | | | | | | | | | |
| Catarrh .. .. .. .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Inflammation [108] .. .. .. | .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. |
| Congestion .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Hypertrophy [109] .. .. .. | .. | 5 | .. | 4 | .. | 1 | .. | .. | .. | .. |
| Non-Malignant Tumour— | | | | | | | | | | |
| A. Fibrous Tumour [110] .. .. | .. | 23 | .. | 10 | .. | 12 | .. | **1** | .. | .. |
| B. Polypus .. .. .. | .. | 4 | .. | 4 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE GENERATIVE SYSTEM (*continued*).** | | | | | | | | | | |
| DISPLACEMENTS AND DISTORTIONS. | | | | | | | | | | |
| A. Retroversion | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| B. Anteflexion | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| C. Retroflexion | .. | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. |
| D. Prolapsus | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Procidentia [111] | .. | 9 | .. | 8 | .. | .. | .. | 1 | .. | .. |
| Malformations— | | | | | | | | | | |
| Absence of Uterus | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| DISEASES OF THE VAGINA. | | | | | | | | | | |
| Inflammation [112] | .. | 14 | .. | 13 | .. | 1 | .. | .. | .. | .. |
| Cicatrix [113] | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Hernia | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Malformations [114] | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| DISEASES OF THE VULVA. | | | | | | | | | | |
| Inflammation [115] | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Abscess | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Tumour [116] | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Tumour of Urethra | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Mucous Cyst [117] | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| FUNCTIONAL DISEASES OF THE FEMALE ORGANS OF GENERATION. | | | | | | | | | | |
| Amenorrhœa | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Dysmenorrhœa [118] | .. | 5 | .. | 5 | .. | .. | .. | .. | .. | .. |
| *Hæmorrhage | .. | 13 | .. | 12 | .. | 1 | .. | .. | .. | .. |
| | .. | 160 | .. | 135 | .. | 18 | .. | 7 | .. | .. |
| **AFFECTIONS CONNECTED WITH PREGNANCY.** | | | | | | | | | | |
| Pregnancy [119] | .. | 3 | .. | 1 | .. | 2 | .. | .. | .. | .. |
| DISORDERS OF THE DIGESTIVE SYSTEM. | | | | | | | | | | |
| Nausea and Vomiting | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| DISORDERS OF THE URINARY SYSTEM. | | | | | | | | | | |
| Albuminuria | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| DISORDERS OF THE GENERATIVE SYSTEM. | | | | | | | | | | |
| Hæmorrhage | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Retroversion of Gravid Uterus [120] | .. | 6 | .. | 5 | .. | 1 | .. | .. | .. | .. |
| Abortion [121] | .. | 9 | .. | 9 | .. | .. | .. | .. | .. | .. |
| Extrauterine Gestation [122] | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **AFFECTIONS CONNECTED WITH PREGNANCY (*continued*).** | | | | | | | | | | |
| AFFECTIONS CONNECTED WITH PARTURITION. | | | | | | | | | | |
| Retention of Part of the Ovum [123] | .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. |
| Hæmorrhage .. .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| AFFECTIONS CONSEQUENT ON PARTURITION. | | | | | | | | | | |
| Subinvolution .. .. .. | .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. |
| Occlusion of Os uteri .. .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | .. |
| | .. | 29 | .. | 24 | .. | 5 | .. | .. | .. | .. |
| **DISEASES OF THE ORGANS OF LOCOMOTION.** | | | | | | | | | | |
| DISEASES OF BONES. | | | | | | | | | | |
| Mollities Ossium .. .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| DISEASES OF MUSCLES. | | | | | | | | | | |
| Progressive Muscular Atrophy [124] | 2 | 2 | 1 | .. | 1 | 1 | .. | 1 | .. | .. |
| | 2 | 2 | 1 | .. | 1 | 1 | .. | 1 | .. | .. |
| **DISEASES OF CELLULAR TISSUE.** | | | | | | | | | | |
| Obesity .. .. .. .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| **DISEASES OF THE CUTANEOUS SYSTEM.** | | | | | | | | | | |
| Erythema— | | | | | | | | | | |
| E. Læve .. .. .. .. | 2 | 4 | 2 | 4 | .. | .. | .. | .. | .. | .. |
| E. Nodosum .. .. .. | .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. |
| Roseola .. .. .. .. | 2 | 2 | 2 | 2 | .. | .. | .. | .. | .. | .. |
| Urticaria .. .. .. .. | 2 | 1 | 2 | 1 | .. | .. | .. | .. | .. | .. |
| Lichen .. .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Psoriasis .. .. .. .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Lepra Anæsthetica [125] .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Herpes [126] .. .. .. .. | 1 | 2 | 1 | 2 | .. | .. | .. | .. | .. | .. |
| Pemphigus .. .. .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Eczema [127]— | | | | | | | | | | |
| E. Simplex .. .. .. | 2 | 4 | 2 | 4 | .. | .. | .. | .. | .. | .. |
| E. Exfoliativum .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| E. Chronicum .. .. .. | 8 | 5 | 8 | 5 | .. | .. | .. | .. | .. | .. |
| Impetigo .. .. .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Ecthyma .. .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Ichthyosis .. .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of completed cases. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE CUTANEOUS SYSTEM (*continued*). | | | | | | | | | | |
| Boils | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Nævus Pilaris | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| PARASITIC DISEASE OF THE SKIN. | | | | | | | | | | |
| Favus | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Scabies | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| | 22 | 30 | 22 | 29 | .. | 1 | .. | .. | .. | .. |
| **CONDITIONS NOT NECESSARILY ASSOCIATED WITH GENERAL OR LOCAL DISEASES.** | | | | | | | | | | |
| Debility [128] | 20 | 55 | 20 | 55 | .. | .. | .. | .. | .. | .. |
| Pain [129] | 5 | 14 | 5 | 14 | .. | .. | .. | .. | .. | .. |
| Unknown [130] | 2 | .. | .. | .. | 1 | .. | **1** | .. | .. | .. |
| Nil [131] | 5 | 4 | 5 | 4 | .. | .. | .. | .. | .. | .. |
| | 32 | 73 | 30 | 73 | 1 | .. | **1** | .. | .. | .. |
| POISONS. | | | | | | | | | | |
| METALS AND THEIR SALTS. | | | | | | | | | | |
| Lead [132]— | | | | | | | | | | |
| Lead Colic | 3 | 4 | 3 | 4 | .. | .. | .. | .. | .. | .. |
| Lead Palsy | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| SILVER. | | | | | | | | | | |
| Silver Stain [133] | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| ACIDS. | | | | | | | | | | |
| Sulphuric Acid [134] | 1 | .. | .. | .. | .. | .. | **1** | .. | .. | .. |
| Carbolic Acid [135] | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Oxalic Acid [136] | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| VEGETABLE POISONS. | | | | | | | | | | |
| Opium [137] | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Alcohol— | | | | | | | | | | |
| Intoxication [138] | 3 | 1 | 3 | 1 | .. | .. | .. | .. | .. | .. |
| Delirium Tremens | 20 | 3 | 17 | 2 | 1 | 1 | **2** | .. | .. | .. |
| Belladonna [139] | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Calabar Bean [140] | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| GASEOUS POISONS. | | | | | | | | | | |
| Sewer Gas [141] | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| | 35 | 10 | 30 | 9 | 2 | 1 | **3** | .. | .. | .. |

# ABSTRACT OF TABLE I.

| DISEASES. | Total number of cases completed during the year. | | Number of cases discharged cured and relieved. | | Discharged unrelieved. | | Died. | | Remaining in the hospital at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| General Diseases, A .. .. .. .. | 167 | 150 | 142 | 119 | 2 | .. | **23** | **31** | .. | .. |
| Do. Do. B .. .. .. .. | 202 | 261 | 153 | 174 | 2 | 42 | **47** | **45** | .. | .. |
| Local Diseases— | | | | | | | | | | |
| Diseases of the Nervous System .. .. .. | 137 | 157 | 93 | 115 | 24 | 31 | **20** | **11** | .. | .. |
| „ Circulatory System .. .. | 81 | 80 | 51 | 54 | 1 | 1 | **29** | **25** | .. | .. |
| „ Absorbent System .. .. | 3 | 4 | 1 | 3 | 1 | 1 | **1** | .. | .. | .. |
| „ Ductless Glands .. .. | 1 | 11 | .. | 2 | .. | 8 | **1** | **1** | .. | .. |
| „ Respiratory System .. .. | 223 | 152 | 167 | 114 | 7 | 1 | **49** | **37** | .. | .. |
| „ Digestive System.. .. .. | 95 | 120 | 63 | 82 | 10 | 24 | **22** | **14** | .. | .. |
| „ Urinary System .. .. .. | 71 | 53 | 46 | 31 | 3 | .. | **22** | **22** | .. | .. |
| „ Female Organs of Generation .. | .. | 160 | .. | 135 | .. | 18 | .. | **7** | .. | .. |
| Affections connected with Pregnancy .. .. | .. | 29 | .. | 24 | .. | 5 | .. | .. | .. | .. |
| Diseases of the Organs of Locomotion .. .. | 2 | 2 | 1 | .. | 1 | 1 | .. | **1** | .. | .. |
| „ Cellular Tissue .. .. .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| „ Cutaneous System .. .. | 22 | 30 | 22 | 29 | .. | 1 | .. | .. | .. | .. |
| Conditions not necessarily associated with General or Local Diseases .. .. | 32 | 73 | 30 | 73 | 1 | .. | **1** | .. | .. | .. |
| Poisons .. .. .. .. | 35 | 10 | 30 | 9 | 2 | 1 | **3** | .. | .. | .. |
| | 1071 | 1293 | 799 | 964 | 54 | 135 | **218** | **194** | 101 | 95 |
| | 2364 | | 1763 | | 189 | | **412** | | 196 | |
| | | | 2364 | | | | | | | |

# APPENDIX TO TABLE I.

NOTE.—*The references to "Reports" allude to St. Bartholomew's Hospital Reports*, 1879.

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1. *Small Pox.*—A Hospital porter caught the disease from sewing up the body of a patient who died of small pox, and on whom a post-mortem examination had been performed. He was removed to the Small Pox Hospital, and died there. This case also infected a case of scarlatinal nephritis (Note 4). The fatal case was a female aged 26, the disease was hæmorrhagic; purpuric spots all over skin, fewer on the backs of the hands than elsewhere; hardly any on the back of the right hand. No internal ecchymoses.

2. *Measles.*—One of the cases which recovered was petechial. One was a man employed in Messrs. Copestake's warehouse, where there had been a considerable outbreak among the men. Of the fatal cases, one was complicated by membranous croup, one by lobular pneumonia.

3. *Scarlet Fever.*

Of the non-fatal cases, 4 were caught in the Hospital. One of these was under treatment for lead colic (a white-lead carrier); a servant, aged 21, for gastric ulcer; in one rheumatism, and another an abscess under each eye followed the scarlatina.

One of the fatal cases had pericarditis and right pleurisy.

4. *Sequelæ of Scarlet Fever.*

Non-fatal cases:—

Complications. pleurisy, 2 cases (double in one, right-sided in one); abscess in neck, one case; empyema (left) one case. This case, while still in the Hospital with tinea decalvans, caught small pox from the fatal case (see Note 1).

Fatal cases:—

Complications: Pleurisy (double), one case; phthisis (right), one case. One case, admitted three months after the eruption, died with large pale kidneys.

5. *Enteric Fever.*

The cases were mostly sporadic. One nurse caught the fever in the Hospital. Two cases occurred in a house in Kingsland Road; one in the College of the Hospital; a house in Wimpole Street, 2 cases; a house in Saffron Hill, 2 cases; a house in Grosvenor Street, 2 cases. Among the localities furnishing more than one case for the Hospital, but not from the same house, may be mentioned Old Ford, Bow; Brick Lane, St. Luke's; Bethnal Green; Bunhill Row; Whitecross Street, St. Luke's; Hoxton; Kingsland Road.

Non-fatal cases:—

Complications: Otorrhœa; albuminuria; pleuro-pneumonia; periostitis of tibia (both tibiæ in one case), of left ulna.

Fatal cases :—

Complications: Left pneumonia, periostitis both tibiæ, thrombosis both iliac veins; perforation of the intestine and peritonitis; pneumonia; in one case perforation had all but commenced.

In 2 cases enteric fever was caught in the Hospital, the patients having been admitted with cardiac disease.

6. *Febricula.*—In one case symptoms resembling those of enteric fever were accounted for by the discovery of more than one dead cat in the cistern which supplied the drinking water.

7. *Ague.*

Tertian: Temp. 106 on admission.
Quotidian: An engineer living at Gravesend.
Irregular: Caught in Central America.

8. *Diphtheria.*

Non-fatal cases :—

One boy had lost a brother and sister with diphtheria, and two sisters had scarlet fever. In another case scarlet fever supervened on the diphtheritic attack; one of the patients was a nurse in a general medical ward.

Fatal cases :—

In 5 tracheotomy was performed.

Post-mortem appearances.—(1) Easily detached membranes as far as bifurcation of trachea, none on tracheotomy wound; right lung old adhesions, left lower lobe catarrhal pneumonia, on both lungs small ecchymoses, kidneys fatty; (2) Tracheotomy, false membrane on upper part of pharynx, near epiglottis, in larynx, and below wound in trachea, but not as far as bifurcation; ecchymoses on surface of both lungs, patches of catarrhal pneumonia; (3) Tracheotomy, false membrane began below larynx, and extended down two inches; in lungs many spots of collapse; (4) Tracheotomy, membrane extending from wound down trachea, in one spot quite occluding it; (5) Ulceration and sloughing as far as epiglottis; all cervical glands very large, some of them sloughing.

9. *Hooping Cough.*

Non-fatal cases :—

In one complicated with measles and left pneumonia.

Fatal cases :—

Complications: Emphysema; right pleurisy with abscess on right side of walls of thorax; tuberculosis of mesenteric glands and intestines.

10. *Puerperal Fever.*

Fatal cases :—

One following miscarriage in a patient suffering from chronic rheumatic arthritis.

In another case an abscess occupied the position of the left psoas muscle, the body of one lumbar vertebra being bare; an abscess in the position of the right iliacus muscle, in the lowest part of the right iliac fossa bare bone of the size of a shilling; abscess between uterus and intestines, amyloid degeneration of intestines, spleen, and kidneys; ulceration of colon; left common iliac and femoral veins occupied by a firm clot; pleuro-pneumonia.

In another, which followed the induction of premature labour with partial placenta prævia, there were two collections of pus, one in a cavity bounded by the left; ovary, uterus, and omentum containing ½ oz. of pus: surface of ovary

ulcerated where it formed the wall of the sac; ovary enlarged: Graaffian follicles containing pus. The second collection of pus in the tissue behind and to the right of the cervix, half an ounce; walls of uterus flabby; decidua remaining; right ovary normal.

11. *Rheumatism, Acute.*

Non-fatal cases:—

Complications: Cardiac in 44; pericarditis in 19; endocarditis in 7; mitral disease in 20.

Other complications.—Albuminuria, pneumonia, syphilis, erythema nodosum, delirium tremens. In one case bleeding to 6 oz. procured relief. One case was readmitted with enteric fever.

First attacks numbered 38, heart affected in 22; second attacks 41, heart affected in 11; third attacks 17, heart affected in 8; fourth attacks 7, heart affected in 3; fifth attacks 1, heart not affected; sixth attacks 3, heart not affected; seventh attacks 1, heart not affected; one eighth and one eleventh attack, heart not affected.

Fatal cases included one first, one third, and one eighth attack; in two of these there was found double pleurisy and pericarditis; in two others mitral disease, one showing white specks in the endocardium surrounded by ecchymoses. All were females.

12. *Rheumatism, Subacute.*—Heart affected in 5; one case post partum.

13. *Rheumatism, Gonorrhœal.*

Joints affected were as follows:—Out of eleven cases shoulder-joint was affected in 2 cases, both shoulders in each; elbow-joint in 2 cases, both sides in each; wrist-joint in 3, one side in each; hip-joint in 1, one side; knee-joint in 9, both sides in 5; ankle-joint in 5, both sides in 3; wrist-joint in 1, one side. The hand was affected once, heel twice, both insteps once.

The lesions were thus distributed:—

(1) Both knees.
(2) Right wrist and hand.
(3) Right hip, knee, big and second toes, left heel and big toe.
(4) Both knees and left heel.
(5) Both knees, elbows, and shoulders.
(6) Both elbows, knees, and insteps.
(7) Both ankles and left wrist.
(8) Both ankles and knees.
(9) Both shoulders, both ankles, right knee.
(10) Right ankle, knee, and wrist.
(11) Right knee, left ankle (second attack).

14. *Rheumatism, Chronic.*—Complications: Lupus, phthisis, bronchitis, and albuminuria, mitral obstruction, each in 1 case; 1 case was apparently due to over-suckling.

15. *Gout, Chronic.*—One case with albuminuria, 1 with cirrhosis of liver and kidneys and hypertrophy of the heart.

16. *Cancer of Pericardium.*

Post-mortem appearances :—(1) Tumours in the brain in left frontal lobe, corpus striatum and posterior lobe, and in right optic thalamus and posterior lobe ; sarcomatous mass occupying pericardium, right pleural effusion, left lung adherent, heart to the right of the middle line, freely movable, œsophagus and straight part of aorta not pressed out ; left pulmonary artery and aorta beyond subclavian slightly pressed on ; growth not invading lungs, small gangrenous patch left lung.

(2) Cancer of pericardium, lungs, liver, spleen, glands, ovary.

Post-mortem appearances :—Both lungs adherent to pericardium, large left pleuritic effusion, left lung collapsed ; all over both surfaces of pericardium small white wart-like growths, non-malignant endocardial growths on mitral valve ; cancer of both lungs, bronchial and mediastinal glands ; right ovary as large as a child's head with purulent contents behind uterus obstructing left ureter ; lumbar glands cancerous, right femoral thrombosis ; cancerous nodules in liver and spleen ; left ureter obstructed and degenerated ; left kidney dilated and degenerated.

*Cancer of Mediastinum.*—Cancer of anterior mediastinum, pericardium, heart, manubrium, glands of lower part of neck and left axilla.

18. *Cancer of Abdomen.*

(1.) Cancer of pylorus, right lung, peritoneum, intestines, mesenteric glands.

(2.) Cancer of peritoneum, one nodule in liver, nodules in gall-bladder, gall-ducts occluded ; cancer of pancreas, mesenteric and lumbar glands, upper surface of diaphragm, both lungs ; all bones easily cut with a knife, cysts in both kidneys.

(3.) Cancer of mesentery extending to and embedding all the pelvic organs ; cancerous peritonitis.

19. *Cancer of Œsophagus.*

(1.) Three inches above cardiac end of stomach the walls of the œsophagus became very thin, the mucous membrane gangrenous. An opening from the œsophagus into right lung at its base, round which opening the lung was gangrenous. Some thickening of cardiac end of stomach, no ulceration, cavity rather small. No dilatation of œsophagus above stricture. Secondary deposits in liver.

(2.) Œsophagus in middle for three inches almost occluded, walls thickened and brawny, internally ulcerated with almost gangrenous patches ; the same at the bases of both lungs.

(3.) Cancer of œsophagus, liver, lumbar and mediastinal glands, abscesses in both lungs ; œsophagus adherent in all its length to the aorta and vertebræ, much narrowed. A large growth protruding from the end of the œsophagus into the cardiac end of the stomach. Above this the œsophagus was corrugated and ulcerated.

20. *Cancer of Stomach.*

(1.) Tumour lay in middle line, stomach quite to left of it.

(2.) Thickening about pylorus, an ulcer on posterior wall just within pylorus.

21. *Cancer of Liver.*

(1.) Cancer of liver, stomach, pancreas, lumbar glands, penetrating vena cava.

(2.) Thrombosis of portal vein and superior cava. Cancer was medullary, one cervical gland involved, cystic duct occluded by a gall-stone. Mesenteric glands cancerous, irregular ulcer on posterior wall of stomach near pylorus, formed by

cancerous glands behind; cancer of lumbar and inguinal glands, both ureters especially the left pressed on but not obstructed; softened clots in vena cava and femoral veins, small cancerous nodules in kidneys and lungs.

22. *Cancer of Gall-bladder.*—Stomach reached to one inch above symphysis, covering in abdomen; cancer of gall-bladder, liver, peritoneum, lumbar glands, cystic duct occluded, common duct free; pyelitis of right kidney, ureter natural, cancer of right sixth costal cartilage and pleura.

23. *Cancer of Pancreas.*

(1.) A cancerous nodule beneath Glisson's capsule, surface rough; gall-bladder cut off from ducts by solid fibrous tissue. In the common duct near its orifice was a gall-stone; common bile duct and pancreatic duct pressed on by a cancerous mass consisting of the head of the pancreas, pancreatic duct much dilated.

(2.) Transverse colon, duodenum and part of ilium adherent to gall-bladder; colon much distended above a constriction in this situation; cystic duct closed by thickened tissue; two large stones in common duct.

24. *Cancer of Rectum.*—In both cases there was vesico-rectal fistula.

25. *Cancer of Kidney.*—Soft cancer of right kidney and right lobe of the liver, involving inferior cava and ulcerating into its right side, occluding the vein.

26. *Cancer of Pelvis.*—One case with retention of fæces, one with intestino-vesical fistula, the fæces being discharged through the bladder.

27. *Cancer of Uterus.*

Non-fatal cases:—

One with vesico-vaginal fistula; one involving also the breasts and skin; one with parametric abscess; one with choreic movements of left thigh, probably from affection of sciatic nerve. (Reports, p. 4.)

Fatal cases:—

(1.) Cancer of peritoneum, lumbar and mesenteric glands, fundus uteri and both ovaries and left breast.

(2.) Soft cancer of right lung, liver, abscess of right kidney; cancer of uterus and vagina, thickening around it, narrowing both ureters which were dilated; no hydronephrosis. (Retention of urine seven days.)

28. *Cancer of Neck.*—Opposite third cervical vertebræ involving muscles and nerves, not the bones, cord not pressed; cancerous nodules in liver, hæmorrhagic infarct in spleen. (Reports p. 257.)

29. *Cancer of Bone.*—Of ribs and sternum.

30. *Lupus.*—Three of nose, one of pudenda.

31. *Tubercular Meningitis.*

(1) Both lungs involved.

(2) Only one tubercle on the choroid plexus; softening and flattening of convolutions, large clear subarachnoid effusion, the same in the ventricles; many tubercles on the under side of the diaphragm; some of the mesenteric glands caseous. (Reports, p. 73.)

(3) Lymph at the base of the brain, but no tubercles visible; tubercles of lungs, pericarditis, tubercles on under surface of diaphragm.

(4) Small ulcers on both sides of ileo-cæcal valve; tubercles in bronchial glands; cavity in left lung, tubercles round it; old ulcers on the anterior wall of the œsophagus: tubercles on sides of cerebral hemispheres, many in the sylvian fissure; large effusion in subarachnoid space round optic commissure; in right lobe of cerebellum a white firm tumour of the size of a walnut.

32. *Phthisis Pulmonalis.*

Non-fatal cases—

Right side more affected in 15 cases.
Left side in 14.
One case of pyopneumothorax; one of pericarditis; one of fistula in ano.

Fatal cases:—

Right side more affected in 3.
Left side in 6.
Both sides in 23.

Complications—Albuminuria in 3; mania a potu, 1; 1 followed measles; ascites 1; gangrene of both lungs, thrombus in branch of right pulmonary artery corresponding to gangrenous patch, 1; ulceration of larynx with gangrene of toes, 1; old thrombosis of lower branch of left pulmonary artery, 1; much ulceration of intestines from jejunum to rectum, in two places in ileum puckering of healed ulcers; other ulcers open with thickened edges, some in both small and large intestine, completely encircling the gut; in centre of right lobe of cerebellum a whitish dense mass, size of a hazel nut, 1.

33. *Acute Miliary Tuberculosis.*

Fatal cases:—

(1) Otorrhœa, tubercle of both lungs and intestine; pyæmic abscesses of both lungs, mesenteric glands caseous, petrous bone bare on both sides.

(2) Complicating Pott's disease.

(3) Tubercular meningitis of base and vault, ventricles of brain dilated; tumour size of a nut growing from right internal auditory meatus resting on the flocculus cerebelli; no necrosis of temporal bone; tubercle of both lungs; heart adherent to pericardium; a diverticulum above ileo-cæcal valve; abdominal inguinal and femoral glands caseous; caseous tubercles in spleen and kidneys.

(4) Tuberculosis of lungs, fauces, tonsils, pericardium, peritoneum, liver, spleen, kidneys, ulcers of stomach and intestines.

(5) Tuberculosis of lungs, pleuræ, peritoneum, liver, kidneys, spleen, base of brain; bronchial and mesenteric glands caseous; caseous mass in posterior outer part of right cerebral hemisphere; recent lymph all round nerves at base of brain, effusion into ventricle.

(6) Irreducible procidentia uteri; tubercular peritonitis; abscesses in both ovaries.

(7) Tuberculosis of lungs, intestines, and choroid plexus, caseous bronchial glands, spleen, and mesenteric glands.

34. *Tabes Mesenterica.*

Fatal cases:—

(1) Tuberculosis of lungs, intestines, peritoneum; phthisis pulmonalis; no amyloid disease.

(2) Parrot's skull; tubercles in both lungs; all abdominal organs matted together by recent lymph; tubercular ulceration of peritoneal surface of intestines above and below ileo-cæcal valve; mesenteric and lumbar glands large and caseous; liver, spleen, and kidneys amyloid.

35. *Tubercular Peritonitis.*

Fatal case:—

Tubercular ulceration of intestine and left lung.

36. *Rickets.*

Non-fatal cases:—

One with well-marked natiform skull of Parrot (congenital syphilis).

Fatal cases:—

One with fatty degeneration of liver and kidneys.

37. *Diabetes.*

Fatal cases:—

(1) Fatty small kidneys and fatty liver.

(2) Cavity in both apices surrounded by caseous material; left kidney cystic and contracted.

(3) Purpuric spots over greater curvature of stomach.

(4) Meninges dry, vessels full, little fluid in ventricles; spinal cord normal; adhesions to both pleuræ; both lungs adherent to pericardium; abscess in right lung; pericardium everywhere adherent; fatty degeneration of liver; spleen not large, soft; kidneys large, very soft, fatty.

38. *Chlorosis.*—With thrombosis of left femoral vein.

39. *Meningitis.*

Non-fatal cases:—

Two of cerebro-spinal meningitis; 1 case of cervical opisthotonos in a child, aged 1 year.

Fatal cases:—

(1) Aged 2, male; two small collections of matter in right pleura; in left lateral sinus an old adherent clot, partly occluding sinus; all pia mater much thickened, infiltrated with yellow-green semi-fluid substance filling sulci; the same on velum interpositum and in ventricles.

(2) Male, aged 1: history of fall 14 days before admission; cervical opisthotonos, vomiting, blindness; soft lymph at base of brain, none round optic chiasma or elsewhere at base further forward than internal edge of pons; posterior part of pons and origins of nerves from medulla oblongata most thickly coated. No lymph or fluid in fourth ventricle; small particles of lymph on convexities of hemispheres, lateral and third ventricles containing much clear fluid. On superior surface of cord within dura mater, and one inch down from foramen magnum and just above cauda equina lymph, but no tubercles anywhere. (Reports, p. 72).

(3) Male, aged 16. Fall on ice half-a-year back, was laid up for a week, then went to work till 10 weeks before admission. Post-mortem—tough adhesions in fork of optic commissure, and lymph on olfactory nerve and adjacent part of hemi-

spheres; whole base covered with lymph; hemispheres adherent in front; fourth ventricle closed in by adhesions; much clear fluid in both lateral ventricles; no tubercles.

(4) Male (barman), aged 33. Pachymeningitis, with fatty degeneration of liver.

(5) Female, aged 16. Purulent meningitis of base and vault, right half of cerebellum containing an abscess larger than a walnut, continuous with an abscess in right petrous bone, which is much necrosed.

(6) Female, aged 22. Meningitis of posterior and lateral aspects of vault; peritonitis.

(7) Female, aged 23. Cerebro-spinal meningitis, under pia mater and on all convolutions and fissures was pus with tough lymph round optic commissure; no fluid in subarachnoid space or in ventricles; soft lymph on choroid plexus and lower part of spinal cord, slightly on cervical enlargement; no fracture, no otorrhœa.

40. *Abscess.*—Abscess of cerebellum, two cysts in left ovary.

41. *Apoplexy.*

Fatal case:—

Male, aged 51. Coma, albuminuria; general loss of power, especially on the right side. Recovery.

Fatal cases:—

(1) Male, aged 60. Right hemiplegia, aphasia. No post-mortem.

(2) Male, aged 19. A large effusion in left hemisphere, which had burst through from the back and outer side of left optic thalamus to the left lateral ventricle and to the surface of the vertex, having ploughed up both corpus striatum and optic thalamus; old endocarditis of mitral valve, large growths on its edge, one ½-in. long and ¼-in. thick; aortic valves thickened, kidneys large; one old infarct.

(3) Male, aged 41. Hæmorrhage into right optic thalamus, and thence into lateral ventricle; corpus striatum and posterior lobe; kidneys hard; left ventricle hypertrophied.

(4) Male, aged 47. Hæmorrhage outside right corpus striatum; kidneys cystic; left ventricle hypertrophied.

(5) Male, aged 45. Hæmorrhage into outer and anterior part of right optic thalamus, and posterior and outer part of corpus striatum; gritty mass in left corpus striatum; lymph and bloody serum in pericardium; kidneys cystic and granular.

(6) Male, aged 51. Hæmorrhage from artery of left sylvian fissure.

(7) Male, aged 56. Hæmorrhage into both lateral ventricles, through corpus callosum, coming from right optic thalamus; old clot in right corpus striatum.

(8) Male, aged 56. Left hemiplegia, aphasia. Four distinct hæmorrhages, one on right side, three on left. (*a*) largest in outer and upper wall of right lateral ventricle forwards to within an inch of apex of anterior lobe, and to within 1½-inches of apex of occipital lobe, not into ventricle; firm, ragged; partly decolorised clot. (*b*) Next largest in left occipital lobe. (*c*) In centre of left optic thalamus. (*d*) In putamen of left side. Bedsore on sacrum.

42. *Hydrocephalus.*

Non-fatal case:—

A female, aged 18, with right hemiplegia. Chronic.

Fatal case:—

Female, aged 6. Effusion of clear fluid into ventricles. Chronic.

43. *Tumour.*—Three non-fatal cases, with history of syphilis, were improved by treatment.

44. *Myelitis.*

Non-fatal cases :—

A male, aged 14, had loss of power in legs and arms, especially the legs, after a wetting ; invasion gradual ; improvement under treatment.

Fatal cases :—

(1) Male, aged 59. A cavity in cervical enlargement, and a distinct patch of softening in dorsal enlargement.

(2) Male, aged 40. General softening in dorsal region ; in muscles on either side of spine several ecchymoses like commencing bedsores ; no disease of vertebræ. Paraplegia.

(3) Female, aged 50. Softening from 2 inches below commencement of medulla oblongata, through all the dorsal region, most marked in two spots, 8 and 10 inches below upper margin of softening ; softening of restiform processes and flocculus. General spinal paralysis.

45. *Hemiplegia.*

Non-fatal cases :—

Right side affected in 32 ; aphasia in 12 ; speech affected in 4 others. Left side affected in 15 ; aphasia in 2 ; speech affected in 3 others. Both sides affected in 1 case ; no aphasia.

Other complications : History of syphilis in 3 ; sensation affected in 5 ; partial hemianesthesia of same side in 3 ; cardiac murmur in 3 (mitral) ; face affected in 2 ; hemiplegia partial in 3 ; rigidity in 3 ; 1 patient talked nonsense, but answered questions rationally ; 1 had coma on admission ; 1 case was preceded by giddiness, lasting a month before the attack ; 1 case of partial right hemiplegia had double internal squint, both pupils being dilated, especially the right ; also

(1) Female, aged 24. Left hemiplegia, aphasia, spastic rigidity. A year before sudden coma, followed by left hemiplegia, partial recovery ; a month ago, sudden coma, followed by aphasia, no increase of paralysis, possibly syphilitic ; not improved by treatment.

(2) Male, aged 47. Hemiplegia right, no aphasia ; rigidity of right limbs, extreme flexion of fingers and thumb ; extreme extension of ankle, slight flexion of toes ; hemianesthesia right side, with impairment of smell, sight, and hearing on right side. Improved under treatment.

A case, following the entrance of a knitting needle through the orbit, is related in Reports, p. 287.

46. *Paraplegia.*—In one case first noticed after lifting a weight ; one case syphilitic ; one case complicated, with loss of power in arms.

47. *Infantile Paralysis.*—In one case all muscles of left leg paralysed, except flexor longus digitorum ; one affecting extensors of left leg.

All the cases were discharged unrelieved.

48. *Other Paralyses.*—Labourer aged 31, paralysis of right forearm from pressure ; female (bookfolder), aged 50, paralysis of right arm from deltoid downwards.

49. *Epilepsy.*

Non-fatal cases :—

With softening, 1 ; epileptic mania, 1 ; syphilis, 1 ; beginning with lactation, 1 ; potus, 1 ; epileptiform coma, 1 ; dementia, 1 ; tremor of recti abdominis, 1.

Fatal case :—

Was a plane maker, aged 52, anterior part of arachnoid and pia mater very full of blood, much fuller than the dependent parts of the meninges ; appearances otherwise natural.

50. *Spasm of Muscles.*—Female, aged 53, tonic spasm of muscles of neck.

51. *Chorea.*

Non-fatal cases :—

First attacks, 13 ; second attacks, 10 ; third attacks, 3 ; fourth attacks, 2 ; sixth attacks, 1 ; history of fright in 12 ; heart affected in 7 ; history of rheumatism in 6, one side only affected in 4, two others began unilaterally, of these the affected side was the right in 5, the left in 1 ; in two cases chorea followed a blow, in one of these a blow had produced a similar attack ; one followed confinement, but may have been due to fright ; one case was maniacal ; one had albuminuria ; the sister of one patient had been previously affected ; a married woman, aged 23, was pregnant ; a case of right hemichorea had hemiplegia ; in several cases more than one possible cause was present, *e.g.*:

(1) Rheumatic fever 3 years ago, this attack preceded by fright.

(2) Third attack, mitral and systolic murmur ; a fright preceded this attack.

(3) History of fright, loud systolic apex murmur.

(4) Third attack, mitral regurgitation ; history of rheumatism, history of fright before first attack.

(5) Third attack, fright preceded first attack, and rheumatic fever followed it ; systolic mitral murmur.

Fatal case :—

Female, aged 15, many purple specks in substance of brain throughout, superficial veins everywhere gorged, cord, &c., natural.

52. *Hysteria.*—The male case was that of a gardener, aged 31, who thought all his body but his head and arms was dead ; hysterical knee, 4 ; hip, 1 ; shoulder, 1 ; dysphagia, 1 ; dyspnœa, 1 ; this case was admitted for the performance of tracheotomy, which was, however, found unnecessary.

53. *Hysterical Paralysis.*—Paraplegia, 2 cases, one of them having the legs alternately affected ; paraplegia, 1 ; hemiplegia, 1 ; speech not affected ; paralysis with anæsthesia, 1.

54. *Various Nerve Disorders.*

Non-fatal cases :—

Spastic paraplegia, 1 ; intermittent clonic contraction of right arm and leg, 1 ; facial and lingual hemiatrophy with myosis right side ; giddiness, deafness right side, tendency to fall to right side, 1 ; abscess in left mastoid region, diplopia, occasional strabismus, pyæmic pneumonia, 1 ; spastic rigidity right leg, ataxia right arm, 1 ; loss of power in muscles of both hands, 1 ; disseminated sclerosis, 2 (spinal only in 1) ; tremors and numbness in right arm, 1 ; tremor right hand, 1 ; loss of

power in left thumb. 1 ; sclerosis of lateral columns, 1 ; tremor of both hands and right foot ; bulbar paralysis (?), dysphagia, paresis of lips, 1 ; convulsion of right pectorales and recti abdominis, 1 ; headache, vomiting, diplopia, optic neuritis, history of syphilis, 1 ; incomplete loss of power left forearm, with partial loss of sensibility, 1 ; partial loss of power in arms, 1.

Fatal case of disseminated sclerosis in Reports, p. 63.

55. *Pericarditis.*

Non-fatal cases all male :—

Complications : albuminuria ; morbus cordis (mitral) ; double pleurisy.

Fatal cases :—

Catarrhal pneumonia ; mitral disease, 2 ; peritonitis and chronic nephritis.

56. *Valve Disease—Aortic.*

Non-fatal cases :—

Murmur systolic in 1 ; diastolic in 5 ; double in 4.

Complication ; angina pectoris ; melancholia.

Fatal cases :—

(1) Dilatation of both ventricles and both auriculo-ventricular orifices ; posterior aortic valve thickened and tied back ; above aortic valves a small aneurismal dilatation.

(2) Also an aneurism of the aorta between the coronary arteries, just admitting the first joint of the finger, and pointing into, but not perforating the pulmonary artery.

(3) Pericarditis.

(4) Hæmorragic infarct right lung, dilated tricuspid, atheroma of arteries, including coronary.

(5) Pleurisy of left side.

*Mitral.*

Non-fatal cases :—

Murmur systolic in 12 ; præsystolic in 7 ; double in 5.

Complications : double otorrhœa with delirium ; old right hemiplegia ; hæmatemesis ; adherent pericardium ; pericarditis.

Fatal cases :—

(1) Boy, aged 5. Double mitral murmur ; pericarditis ; hooping cough.

(2) Adherent pericardium.

(3) Mitral regurgitation ; rheumatic fever five times ; infarcts in spleen and kidneys.

(4) Old left empyema ; all valves attacked ; pericardium universally adherent ; heart much dilated ; capsule of liver much thickened ; nutmeg section.

(5) Mitral stenosis ; infarcts in both lungs ; pleurisy right side.

(6) Adherent pericardium ; aneurism of mitral valve ; old infarct in spleen ; large infarct in base of left lung.

(7) Fibrocystic tumour in broad ligament.

(8) Growths on tricuspid ; mitral stenosis ; infarct left kidney.

*Complicated.*

Non-fatal cases :—

Aortic and mitral affected in 14 cases ; aortic, mitral, and tricuspid in 1 ; aortic and mitral obstruction in 2 ; double aortic and mitral murmurs in 2 ; double mitral and systolic aortic murmur in 1.

Fatal cases :—

Adherent pericardium in 3 ; aortic and mitral disease in 5 ; aortic, mitral and tricuspid in 2 ; obliteration of coronary artery in 1.

*Congenital.*—Probably persistent foramen ovale.

57. *Dilatation.*

Fatal case :—

Man aged 57. Heart universally adherent to pericardium ; all cavities dilated ; ante-mortem clots in both auricles and apices of ventricles ; aortic valves adherent and incompetent, minute growths on their edges ; atheroma of aorta ; ascites ; nutmeg liver ; granular kidneys ; posterior tibial artery of right side very atheromatous ; no embolus ; clot in posterior tibial vein not entirely obstructing it. During life there was albuminuria and gangrene of the legs.

58. *Fatty Degeneration.*

Fatal cases :—

(1) Male, aged 20. Adherent pericardium ; pneumonia left.

(2) Female, aged 33. Left ventricle the more degenerated.

59. *Aneurism of Aorta.*

Non-fatal cases :—

Abdominal aorta in one ; innominate also in one.

Trades—Soldiers, 2 ; painter ; ship's steward ; ticket collector ; gas stoker ; housewife ; of each, 1.

Fatal cases :—

(1) Male, aged 46. Aorta dilated from within pericardium, nearly to the end of the thoracic portion ; in the ascending part, a sac as large as a small hen's egg ; descending part adherent to vertebral column opposite 5th dorsal vertebra, where the bone was eroded ; a little lower was a perforation into the œsophagus as large as a pea, leading from the aneurism ; in the aneurism a clot, the interior covered with atheroma, the greater part not ulcerated ; no pressure on bronchus or large veins ; blood in stomach and duodenum.

(2) Aneurism of commencement of arch, between coronary and innominate ; a very large aneurism eroding several ribs and lying under the right pectoral muscles, its posterior wall formed by the right lung ; the aneurism opened into the aorta by a round hole as large as a florin ; no perforation of the large bronchi or œsophagus ; large effusion in each pleura.

(3) Male, aged 44. Uniform dilatation of aorta from aortic valves to origin of innominate ; on wall of dilatation, a secondary pouch as large as a nut ; atheroma ; general dilatation of heart.

(4) Clerk, aged 54. Aneurism of anterior part of first part of arch of aorta with a small shallow sac beyond the left subclavian, and a fusiform extension as far as the innominate ; the aneurism was as large as a child's head ; left vagus compressed ; œsophagus and trachea not compressed by aneurism ; anterior part of aneurism filled by firm adherent fibrinous clot.

(5) Watchman, aged 55. Aneurism of aorta beyond left subclavian artery.

(6) Laundress, aged 40. General aneurism of posterior wall of arch from innominate to beyond left subclavian, as large as a child's head, filled with clot, through which a tunnel led to liquid blood outside the clot; second rib and muscles of first intercostal space worn away; aneurism covered by fibres of pectoral muscles and skin; left lung engorged; lower lobe gangrenous; lymph and fluid in pleura; right lung pressed; gummata in liver.

(7) Housewife, aged 42. Came in with symptoms of dyspnœa; tracheotomy was performed for its relief. At the end of the aortic arch was an aneurism as large as a small orange, pressing on the trachea; orifice the size of a shilling; a little further, a smaller aneurism; no disease of larynx; liver nutmeg, with scars as of old gummata; kidneys granular, much scarred.

Occupations—Butcher; cabinet-maker; compositor; porter; clerk; watchman; laundress; housewife; each, 1.

60. *Rupture.*—Fatal case; a soldier aged 59. One inch above aortic valves the aorta was torn almost completely across, and partially one-third inch higher, the torn parts very thin, the rest not atheromatous; aortic and mitral insufficiency, heart hypertrophied, but not enormously.

61. *Phlebitis.*

Non-fatal case:

Gouty phlebitis in a clerk aged 64; complicated with embolic pneumonia.

Fatal case: a female aged 27:

Firm adherent clots in both common iliac veins, left vein had become a hard cord surrounded externally by a little thin pus; both clots extended into the femoral vein; lymphatics at bifurcation of these veins large and hard.

62. *Phlemasia dolens.*

Non-fatal cases:

A type-founder aged 42, right leg.

A woman aged 26, right leg affected; flooding after labour; symptoms began two days after delivery.

63. *Obstruction.*

Non-fatal cases:

(1) Thrombosis of left saphena vein with gouty inflammation.

(2) Œdema of all the head and trunk above the diaphragm, and of the right arm as far as the elbow; spleen large; double otorrhœa; intercurrent erysipelas and albuminuria.

(3) Thrombosis of right femoral vein.

(4) Thrombosis of veins of right leg.

(5) Thrombosis of vena saphena; hæmorrhage from bowel.

Fatal cases:

(1) Housewife aged 36; thrombosis of portal vein; abscess on surface of liver; its anterior wall formed by abdominal wall; portal vein at its entrance quite occluded; and along its course many abscesses in all the lobes of the liver; the rest of the tissue normal.

(2) Button-hole maker aged 64. Thrombosis of portal vein, impacted gall-stone, gall-stone in common duct, duct dilated below; bladder full of gall-stones, adherent to omentum, internally ulcerated, stricture of cystic duct at junction with common duct; portal vein containing a softening ante-mortem clot, intestine blood stained, much congestion beginning below duodenum, and extending to rectum; spleen large, very soft, kidneys jaundiced, cyst in left.

64. *Hypertrophy of Glands.*

Five cases of lymphadenoma were discharged.

Fatal case: a boy aged 3.

Ecchymoses under skin, pleuræ, endocardium; amyloid reaction of liver and intestines; lumbar, inguinal, ulnar, axillary and cervical glands enlarged but not greatly; hæmorrhages into retina; the microscope showed in the liver abundant new adenoid tissue surrounding normal liver tissue.

65. *Exophthalmic Bronchocele.*

Fatal case: a housewife aged 16.

An attack of pleurisy supervened, and the goître almost disappeared the night before death, no danger being at the time apprehended; the thyroid after death was 3 inches long and 1½ inch wide.

66. *Addison's Disease.*

Fatal case:—

A pipe maker, aged 26, ileum constricted by a diverticulum, the point of which adhered to the attachment of the mesentery where the latter is attached to the posterior wall of the abdomen. The diverticulum was 3 feet long, and arose 2½ feet above the ileo-cæcal valve; no ulceration of the bowel, but redness. Right suprarenal very large and hard, left less so, showing a caseous deposit in every part except external layer.

67. *Bronchitis, Acute.*

Non-fatal cases:—

In two following a fall into the Thames; in one with laryngitis and albuminuria.

Fatal cases:—

One with lobular pneumonia; one with laryngitis.

68. *Bronchitis, Chronic.*

Non-fatal cases:—

Complications: Phthisis, 2; albuminuria, 2; pleurisy, 4; otitis interna; ichthyosis; aortic disease; gout; cirrhosis of liver and arterial fibrosis; eczema marginatum; pigmentation of skin of trunk following small-pox; one case followed pleuro-pneumonia; one was relieved by bleeding to 8 oz.

Fatal cases:—

Complications: Albuminuria, 4; pleurisy; mitral disease.

69. *Pneumonia.*

Non-fatal cases:—

Right side affected in 37; left side in 27; both sides in 5.

Complications: Abscess of chest wall; enlarged spleen; delirium tremens

Fatal cases:—

Right side affected in 5; left side in 2; both sides in 4.

Complications: Pericarditis; abscess in opposite lung; two gangrenous abscesses at base of affected lung; chronic nephritis; double pneumonia, left upper lobe lobar pneumonia, left lower lobe and right lung lobular pneumonia, double pleurisy;

in a man aged 42, small adhesions both sides, lung tissue containing very little air, surface uneven and unequally resisting; on section honeycombed, small cavities with distinct fibrous walls, confined to superficial half-inch all over the lung: in left lung a tract of ordinary pneumonic tissue.

70. *Pleuro-pneumonia.*

Non-fatal cases:—

Right side affected in 12: left side in 6: both sides in 1: one occurred post partum.

Fatal cases:—

Complications: pericarditis; in a pyæmic case (a male child aged 1 year) there was an abscess in the ear, not perforating tympanum, and one on anterior abdominal wall above pubes; lungs full of pyæmic abscesses.

71. *Gangrene.*—The fatal case occurred in a man aged 47; it followed an accident, which produced pleuro-pneumonia of the right side.

The left lung was solid; œdema of right upper lobe; middle lobe grey and solid; lowest lobe gangrenous in patches, the lowest patch as large as an orange, and communicating with pleura; no broken ribs.

72. *Cirrhosis,* in 1 fatal case, complicated by chronic nephritis.

73. *Emphysema.*—Fatal cases: complications—

Besides fatty and dilated heart, there was a case complicated by old pachymeningitis, and one by mitral disease and chronic nephritis.

74. *Collapse.*—Fatal case in a child, aged 8 months, with contraction of glottis.

75. *Pleurisy.*

Non-fatal cases.

Right side affected in 25; left side in 22; both sides in 1.

Two cases were chronic; in 2 there was no effusion; 1 followed a fall from a roof about 30 feet; bloody serum flowed on paracentesis.

Complications: phthisis; pericarditis; erysipelas faciei; anasarca; old consolidation.

Fatal cases: right side affected in 4; left side in 2; both sides in 4.

Complications: pericarditis, 2; 2 unusual fissures in liver, right and left lobes nearly equal in size; gangrene of lung, especially middle and lower lobes; albuminuria, also a transverse fissure in right lobe of liver from right border nearly to suspensory ligament.

One case followed a fifth attack of rheumatic fever; there was pericarditis and endocarditis; both lungs were adherent to pericardium; clear effusion in both pleuræ; pericardium universally adherent; great hypertrophy and dilatation of heart, with fatty degeneration; thickening of tricuspid valve; small scar in wall of left auricle; thickening of mitral and 1 pulmonary valve; aortic valves incompetent; liver nutmeg, no infarcts.

76. *Sequelæ of Pleurisy.*

Non-fatal case:—

Consolidation of left lung; recent lobular pneumonia.

77. *Empyema.*

Non-fatal cases :—

Right side affected in 1 case ; left side in 4 cases.

One case discharged through the lung ; gangrene and phthisis followed.

One was re-admitted with sequelæ of empyema, caries of rib, and pulmonary fistula.

Fatal cases :

In all the right side was affected.

In 1 case the empyema was partly loculated, and there was pneumonia of the same side.

78. *Tumour.*—In the fatal case death occurred with symptoms of internal hæmorrhage ; no autopsy was allowed.

79. *Gastritis.*—A patient was readmitted with typhoid, with which another of his family had been attacked. One case was complicated by melæna, another had an abdominal tumour.

80. *Chronic Ulcer :* –

Fatal cases.

(1). Male, aged 57. Two perforating ulcers of stomach on its anterior surface measuring $\frac{1}{4}$ in. × $\frac{1}{8}$ in., situated 1 in. below upper curvature, and $1\frac{1}{2}$ in. from pylorus. These perforations were in the base of a large ulcer, 1 in. × 2 in., the long diameter vertical ; edges of ulcer thick and overhanging, extending to lesser curvature. Some contraction within pylorus ; another large ulcer along lesser curvature, nearer to cardia. General peritonitis.

(2). Female, aged 54. Ulceration into pancreatic artery, death from hæmorrhage ; middle of stomach contracted.

81. *Typhlitis.*—Fatal case in a woman, aged 22. Acute peritonitis resulted from ulceration of vermiform appendix gastrotomy was performed.

82. *Dysentery.*—Fatal case in a female, aged 55. There was abscess of liver. Albuminuria during life.

83. *Ulceration.*—Fatal case in a boy, aged 15. Small hard fæcal mass in appendix vermiformis producing ulceration into peritoneal cavity.

84. *Perforation.*—Fatal case in a male, aged 22. Fluid fæces in abdomen ; ulceration of intestine from duodenum to 18 in. above cæcum, Peyer's patches being principally attacked ; a gangrenous patch opposite the bladder.

85. *Internal Strangulation* :—

Fatal cases :

(1) Male, aged 27. A volvulus at the end of the ileum had produced sloughing of the cæcum.

(2) Male, aged 18. A band of omentum adherent to the end of a diverticulum over which a loop of small intestine had been folded twice ; this was easily unfolded by simple rotation ; the diverticulum seemed to be a persistent omphalo-mesenteric duct ; no adhesions ; no peritonitis.

86. *Diarrhœa and vomiting.*—Fatal case in a female, aged 43. Neither history nor autopsy threw any light upon the cause.

87. *Abscess* :—

Non-fatal cases : one was tapped, one had necrosis of a rib.

Fatal cases.

(1) Sailor, aged 34. The abscess had burst into the right pleura, producing an empyema ; large intestine ulcerated throughout.

(2) Male, aged 29. He had had a short attack of fever in India, and on admission suffered from dysentery. The abscess was tapped in the 9th right space ; adhesions round it but liver not closely adherent to body walls ; adhesions on both lungs to chest and pericardium ; peritonitis ; all large intestine universally ulcerated ; no ulcers in small intestine. An abscess at back of right lobe of liver as large as a child's head, bounded in front by liver, below by right kidney ; ulceration had extended to kidney ; many other abscesses in liver in various stages,

88. *Cirrhosis.*

Non-fatal cases :—

Complications ; morbus cordis ; chronic nephritis.

Fatal cases :—

Complications ; left pleurisy ; dilated heart ; cirrhosis of kidneys with hypertrophied left ventricle.

89. *Lardaceous Liver.*

Fatal case in a boy aged 15.

Destruction of part of left inferior maxillary and seventh and eighth ribs by ulceration ; heart containing a small cavity with caseous and granular contents in wall of left ventricle, within the heart opposite this a small piece of fibrin ; much ascites, liver weighing 58 ozs., surface uneven, capsule thickened in parts ; amyloid reaction ; a white mass, the size of a walnut, in lower part of right lobe ; spleen weighing 36 ozs., adherent to diaphragm, amyloid reaction and hæmorrhagic infarcts ; stomach amyloid reaction ; none of intestine or pancreas ; kidneys soft, pale, surface rough, capsules rather adherent ; a small tuberculous mass in left kidney with ulceration of one pyramid ; amyloid reaction ; every gland in colon pigmented.

90. *Echinococcus Hominis.*

Fatal cases :—

(1.) Male, aged 49, who died suddenly after paracentesis ; the trochar had penetrated a small cyst in the right lobe, but not the chief cyst ; a large cyst in spleen ; kidneys contracted.

(2.) Female, aged 27 ; diagnosis of abscess of right kidney, paracentesis arranged, death after chloroform ; autopsy showed recent peritonitis ; hydatid in left lung as large as an orange ; large hydatid cyst in left lobe of liver ; right pyelitis.

91. *Jaundice.*

Non-fatal cases :—

1 of one year's, 1 of two years' duration ; 1 with pregnancy five months ; 1 with gout ; 1 with hepatic colic.

92. *Perforation.*—Fatal case in a private nurse, aged 28. Two openings into duodenum, just outside pylorus, one the size of a pin's head, the other as large as a threepenny piece; in the larger a gall-stone the size of a hazel nut, in the smaller one as large as a pea; gall-bladder full of gall-stones.

93. *Hypertrophy.*—Enlargement of spleen in a male aged 27, probably due to syphilis.

94. *Leucocythæmia.*

Fatal cases:—

(1) Male, aged 41; general peritonitis, spleen and lumbar glands enlarged and affected with new growth; effusion in both pleuræ.

(2) Female, aged 52; general dropsy, hydro-peritoneum; thorax; pericardium; on spleen one small diaphragmatic adhesion; weight of spleen, 39 oz., the new growth confined to eight distinct splenic patches, none elsewhere.

95. *Peritonitis.*

Non-fatal cases:—

1 probably due to disease of vermiform appendix; 1 complicated with intercurrent albuminuria and left pleurisy; 1 complicated by intercurrent intestinal obstruction.

Fatal cases:—

(1) Male, aged 35; abdominal cavity marked by an adhesion into two cavities; all coils of intestine adherent in lower cavity; large old gastric ulcer, 1in. × 1½in., at entrance of œsophagus, nearer lesser than greater curvature; ulcer had not penetrated to pancreas which adhered to its base.

(2) Male, aged 43; complicated with double phthisis.

(3) Female, aged 39; double pleurisy, peritonitis; cystic kidneys; uterus with ovaries weighing 8 oz.; mucous membrane red, cavity containing shreddy red matter; above external part of os much puckering, no breach of surface.

(4) Female, aged 30; division of cervix uteri for cicatricial post partum stenosis of os externum; small abscess in right broad ligament.

96. *Ascites.*

Non-fatal cases:—

In 1 old left hemiplegia; 1 probably due to malignant disease, paracentesis.

97. *Tumours.*—3 pelvic, 1 of these perhaps bony; 1 perhaps pregnant; 2 probably floating kidneys; 4 probably malignant, 1 of these probably cæcum; 1 case was complicated by thrombosis of both femoral veins.

98. *Bright's Disease—Acute.*

Non-fatal cases:—

2 had pleurisy, one with mitral disease; 1 was possibly scarlatinal; 1 occurred post-partum.

Fatal cases:—

1 had pleurisy; 1 erysipelas.

99. *Bright's Disease—Chronic.*

Non-fatal cases:—

Complications: Morbis cordis in 3; 2 had cirrhosis of liver, with hypertrophied left ventricle; 1 had syphilis; 1 was chronic, with occasional paroxysms.

Fatal cases:—

Besides hypertrophied and dilated heart, and ascites and anasarca, the following may be noticed as complications:—

Valvular disease of heart, 9; pericarditis, 5; pleurisy, 2; pneumonia, 2.

Other complications were thus distributed:—

Atheroma of arteries, old infarct left kidney; enlarged spleen and lymphatic glands, intercurrent typhoid; fenestrated aortic valves; endocarditis with old pericarditis; intercurrent rheumatic fever and pericarditis.

In a female aged 65, about a yard above the ileo-cæcal valve was a diverticulum of the small intestine, attached by a band to the mesentery near the ileo-cæcal valve; foramen ovale widely open, a thin band being stretched across the opening.

100. *Abscess.*—Fatal case in a woman aged 25. History of a fall a year previously, since when symptoms began; amyloid disease of liver, heart, and spleen; large abscess of right kidney, matting together all the pelvic organs, and narrowing, but not quite occluding, the ureters; small abscess in left side of pelvis; tubercles in right lung, clot in branch of right pulmonary artery. Pus had been discharged with urine during life.

101. *Hæmaturia Renalis.*—In 2 cases intermittent.

102. *Diuresis.*—In 1 case with albuminuria.

103. *Inflammation.*—Right ovary affected in 3; left ovary in 4; both ovaries in 8.

104. *Abscess.*—Fatal case in a woman aged 24. Abscess of ovaries, parametritis, pyæmia; left ovary as large as a small orange, and full of pus. Outside it the tissue lining the pelvis is honey-combed by abscesses containing much thick pus; left common iliac and femoral veins containing firmly adherent clot, quite occluding vein; left broad ligament containing pus channels; wall of uterus free from abscesses except round os uteri and upper part of vagina, where there are several small abscesses; lining of uterus and vagina looks healthy; abscess in right ovary; one small collection of pus in right broad ligament.

105. *Pelvic Peritonitis.*

Non-fatal cases:

In 1 case following vaginitis; in 1 case following the use of stems; 1 case situated in the inguinal canal.

A remarkable case (a girl aged 18) was admitted as a case of ovarian tumour with a history of pain in the right groin for 3 months, this ceased for 3 months, then a sudden attack of pain in the right groin; date of swelling uncertain. On admission great pain, fever, a large tumour probably inflamed ovarian; tapping with aspirator; fluid serous like peritoneal fluid; pain and fever ceased; cystitis supervened, discharge of blood and fluid (like that which came from the tumour) from bowel; pus in urine; the tumour had perhaps burst into bowel or bladder; the tumour was poulticed and burst at the puncture. Subsequently a tumour,

probably a small ovarian, was found lying at the bottom of the large collection, of which it was probably the cause. The patient while in the Hospital contracted typhoid fever, the temperature reached 105·2, and there was a relapse with hæmaturia. She has since developed albuminuria, probably due to amyloid disease, the discharge from the abdomen continuing.

106. *Pelvic Cellulitis.*

Non-fatal cases:

(1) A case of "parametritis transversalis," an abscess discharged in left groin, leading to a hardness in the abdominal walls, uterus free; nothing in pelvis. Symptoms began a month after confinement.

(2) Right psoas affected, abscess broke under right Poupart's ligament.

(3) "Parametritis vesico-vaginalis," pus was discharged per urethram.

Fatal case:

"Psoas parametritis" of right side.

107. *Abscess.*

Non-fatal cases:

(1) Opening into bladder and rectum.

(2) Parametritis transversalis, putrid pus was discharged.

(3) Post-uterine perimetritis.

Fatal case.

Abscess discharged at back of right thigh and per rectum; abscess was situated behind right ovary, opening into rectum and also at back of right thigh.

108. *Inflammation.*—3 cases of endometritis were relieved.

109. *Hypertrophy.*—Of posterior lip of cervix in 1 case.

110. *Fibrous Tumour.*

In 1 case ergotine and in another sclerotic acid was injected with success.

Fatal case: After incision of the tumour, death from peritonitis; fibroid of right wall of uterus with a capsule, $2\frac{1}{2}$ inch × $10\frac{1}{16}$ inch, upper part free.

111. *Procidentia.*

In four cases the vulva was sewn up with success.

In 1 case the fossa navicularis was enormously enlarged and perforated at the bottom; uterus measured 3 inch, hymen entire but lacerated at one point; the fossa navicularis contained the procident fundus uteri, the hole in its floor would admit the finger. A disc and stem pessary gave some relief; there was reason to believe that the patient lived on her complaint, and forced the uterus down.

In 1 case death from septicæmia followed the repair of the perineum.

112. *Inflammation.*—In 1 case with vaginismus; in 1 case following the use of a pessary; in 1 complicated with urethretis; in 1 with endometritis.

113. *Cicatrix.*—Connected with pain in right foot, Reports, p. 5.

114. *Malformation.*—In a girl aged 16 the upper part of the vagina was occluded, in its roof two small holes were hardly to be seen, through which very fœtid purulent fluid oozed; uterus present; catamenia regular.

115. *Inflammation.*—With vaginismus secondary to inflamed hymen, which was removed.

116. *Tumour.*—In a woman aged 34. Fibrous tumour in region of left nympha, above and to left of meatus urinarius, size of a large nut; easily removed.

117. *Mucous Cyst.*—In a woman aged 24, a long sausage-shaped tumour parallel with urethra in anterior wall of vagina, and to right side of urethra, as large as the middle finger; not communicating with urethra, containing perfectly clear watery fluid.

118. *Dysmenorrhœa.*—Two cases of spasmodic dysmenorrhœa were relieved by the use of bougies.

119. *Pregnancy.*—In one case of supposed ovarian tumour the pregnant uterus was twice tapped without any ill results.

120. *Retroversion of Gravid Uterus.*

In one case the diagnosis was doubtful.

(1) Pregnant four months, first symptom retention of urine.

(2) Pregnant two months, no retention.

(3) Pregnant four months, first symptom difficult micturition noticed after a strain, then difficult defæcation; abortion at five months.

(4) Pregnant three months, first symptom partial retention of urine for a week and then absolute retention; 160 ozs. of urine of sp. gr. 1010 were drawn off, five hours later 55 ozs. sp. gr. 1005, in the next 24 hours 189 ozs. of sp. gr. 1013 were drawn off: blood remained in the urine for some time.

(5) Four children, all footling, forceps applied on after-coming heads. Pregnant three months; on pulling heavy bedstead felt something give way, since then difficult micturition, conjugata vera estimated at 2½in. Abortion, retained placenta. Injection of carbolic acid, 1:100 was followed by syncope; restored by artificial respiration.

121. *Abortion.*

Four at third month; one at fifth month; one at sixth month.

In one there was retained placenta; in one chronic septic intoxication followed abortion; one was induced on account of advanced phthisis.

122. *Extrauterine Gestation*, with procidentia uteri.

123. *Retention of part of the Ovum.*—In one case a placental polypus produced weekly discharges of blood, the uterus measured 2½ inches.

124. *Progressive Muscular Atrophy.*

Of the non-fatal cases, in one the symptoms were confined to the left leg, and in one there was dysphagia and dyslalia, suggesting implication of the medulla; the dysphagia improved.

The fatal case was one of bulbar paralysis.

125. *Lepra Æsthetica.*—An account of this case, which has again been in the Hospital, will be found in Reports p. 283.

126. *Herpes.*—Two labialis; one zoster.

127. *Eczema.*—One case complicated with erysipelas.

128. *Debility.*—From destitution 3; post partum 2, after rheumatic fever; with pain in both kidneys; after febricula; after mumps; with imbecility and probably after fever; with staggering gait, from alcohol; with retroflexion of uterus; with frequent micturition; probably after typhoid fever; left hemiplegia; after diarrhœa; from oversuckling; with bronchial catarrh; after an attempt at suicide by drowning; with marasmus; from neglect; of each one case.

129. *Pain.*—In abdomen 5; in head 4; painful micturition 2; toothache 2; in right ovary 1; in right kidney 1; in left side 1; after a blow 1.

130. *Unknown.*—In the fatal case no autopsy was allowed.

131. *Nil.*—A woman with no disease had been under uterine treatment "for 30 years."

132. *Lead.*—The occupations were the following:—White lead carriers 4; laundress 1; plumber 1; painter 1; club steward (who had to do with pewter pots) 1.

133. *Silver stain.*—A man aged 69 had been for some time in the habit of painting his fauces with solution of silver nitrate; only the face and neck were affected.

134. *Sulphuric acid.*—Fatal case. Angles of mouth destroyed by acid, light brown; lips shrivelled and grey internally; tongue, mouth, fauces, uvula and pharynx only slightly greyish; œsophageal mucous membrane greyish, wrinkled, muscular substance sodden and grey, no perforation. Pericardium contained no fluid, felt dry, and was especially grey at point of contact of œsophagus, as was also the back of the heart, especially the right ventricle; the change extending into the muscular substance. Diaphragm, and a layer of lung on each side $\frac{1}{8}$-inch thick hardened and grey, vocal cords swollen, trachea grey to bifurcation, epiglottis not eroded. Below diaphragm the œsophagus ended in some blackened shreds of tissue, and the intestine near the cardiac end of the stomach fell to pieces at the least touch. Inner surface of intestine as far as rectum greyish and rotten, as was also the omentum. Where not rotten the intestines were firmly contracted. Liver drab in colour, and feeling like a leathery elastic bag of fluid, due to an unhardened centre with hardened surface. Spleen in same state as liver, also kidneys. Blood in all abdominal vessels solid and friable. Bladder greyish internally, contracted and empty. Penis retracted and erect. Psoas and iliacus split easily into shreds. Acid penetrated abdominal wall at navel.

135. *Carbolic Acid.*—Attempted suicide, 1 case; mistake 1.

136. *Oxalid Acid.*—Mistake.

137. *Opium.*—Attempted suicide, 1; opium-eating in a German governess, 1.

138. *Delirium Tremens.*—One, with suicidal tendencies.

Of the fatal cases, 1 was complicated with epilepsy ; in the other the dura mater was found thickened and the brain watery.

139. *Belladonna.*—A child, 4 years old, drank about a teacupful of Fotus belladonnæ, given for an eye lotion, representing about 12 grains of the extract, by mistake for tea.

140. *Calabar Bean.*—A railway porter ate a bean which fell out of a bag in course of transport by the Great Northern Railway. Other beans were found in his pocket.

His symptoms were collapse, coldness, oscillating pupils, heart intermitting and slow. An emetic relieved him.

141. *Sewer Gas.*—A sewer-man.

Taking the causes of all the poisoning cases (not including lead, silver, alcohol, or sewer-gas), we find—

Due to mistake, 4 ; attempted suicide, 2.

*Showing the comparative Frequency and Mortality of each Disease at different Ages.*

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| **GENERAL DISEASES, A.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Small Pox .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | 1 |
| Sequelæ of S. P.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chicken Pox .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. |
| Measles .. .. | 6 | 3 | **1** | **2** | 1 | 4 | .. | .. | .. | 1 | .. | .. | 3 | 2 | .. | **1** | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 12 | 13 | **1** | **3** |
| Sequelæ of Measles | 2 | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | .. |
| Scarlet Fever .. | 7 | 5 | **3** | **3** | 15 | 12 | .. | .. | 2 | 3 | .. | .. | 3 | 4 | .. | .. | 3 | 4 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 30 | 29 | **3** | **3** |
| Sequelæ of S. F.. | 2 | 7 | **1** | .. | 10 | 7 | **2** | **2** | 4 | 2 | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 18 | 18 | **3** | **2** |
| Typhus .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Enteric Fever .. | 4 | 3 | .. | .. | 5 | 1 | **2** | .. | 7 | 5 | **2** | .. | 16 | 8 | **1** | **5** | 18 | 10 | **3** | **2** | 3 | 4 | **2** | **2** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 53 | 31 | **10** | **9** |
| Sequelæ of E. F. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | .. |
| Febricula .. .. | 2 | 4 | .. | .. | 2 | 1 | .. | .. | 1 | 4 | .. | .. | 2 | 3 | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 9 | 13 | .. | .. |
| Ague— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tertian .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Quotidian .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |

D

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| **GENERAL DISEASES, A (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ague (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Irregular | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Sequelæ of A. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Diphtheria | .. | .. | 2 | **4** | **2** | .. | .. | .. | **2** | 1 | .. | .. | **1** | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 3 | **4** | **5** |
| Sequelæ of D. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Hooping-cough | .. | 4 | 2 | **2** | **2** | 2 | 2 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | 4 | **2** | **2** |
| Mumps | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| Pyæmia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Puerperal Fever | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | **5** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | **6** |
| **GENERAL DISEASES, B.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rheumatism— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acute | .. | .. | 1 | .. | .. | 3 | 2 | .. | .. | 4 | 5 | .. | .. | 21 | 24 | .. | **2** | 28 | 26 | .. | **2** | 12 | 3 | .. | .. | 2 | 3 | .. | .. | 1 | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 71 | 68 | .. | **4** |
| Subacute | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | 1 | .. | .. | 3 | 4 | .. | .. | 2 | 8 | .. | .. | 1 | .. | .. | .. | 2 | 3 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 12 | 16 | .. | .. |
| Gonorrhœal | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | .. | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 11 | .. | .. | .. |
| Synovial | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| Muscular | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Lumbago | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| Chronic | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 3 | 3 | .. | .. | 1 | 5 | .. | .. | 1 | 2 | .. | .. | 2 | 7 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 10 | 18 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| GENERAL DISEASES, B (*continued.*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gout— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acute .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | .. | .. |
| Chronic .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 4 | .. | .. | .. | 3 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 8 | 3 | .. | .. |
| Chronic Osteo-Arthritis.. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 3 | .. | .. |
| Cancer— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| of Pericardium.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 |
| of Larynx .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| of Lungs .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| of Mediastinum .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| of Abdomen .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 3 |
| of Œsophagus .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. |
| of Stomach .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | 1 | .. | 2 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | 2 |
| of Liver .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | 1 |
| of Gall-bladder.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| of Pancreas .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| of Intestines .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| of Rectum .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| of Kidney .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. |
| of Pelvis .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| of Uterus .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 3 | .. | .. | .. | 8 | .. | 2 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 4 | .. | .. |
| of Vagina .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. | .. | 1 | .. | .. | .. | 6 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 23 | .. | 2 |
| of Neck .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| of Bones .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| GENERAL DISEASES, B (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Epithelioma— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| of Cervix Uteri | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 6 | .. | .. |
| of Vulva | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. |
| Lupus | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. |
| Scrofula | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. |
| Local Scrofulous Affections— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tubercular Meningitis | .. | .. | 3 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 2 | |
| Phthisis Pulmonalis | .. | .. | 1 | .. | 2 | .. | 2 | .. | 3 | .. | .. | 1 | 4 | 1 | 2 | 8 | 12 | 5 | 4 | 4 | 7 | 8 | 5 | 6 | 4 | 6 | 3 | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | 21 | 30 | 23 | 17 | |
| Acute Miliary Tuberculosis | .. | .. | 2 | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 3 | 4 | |
| Tabes Mesenterica | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | | |
| Tubercular Peritonitis | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | |
| Tuberculosis of Kidneys | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | |
| Rickets | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | .. | |
| Cretinism | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | |
| Diabetes | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | 1 | 1 | 1 | 1 | 1 | 1 | .. | 2 | .. | .. | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | 5 | 4 | 4 | 2 | |
| Purpura— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Simple | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| **GENERAL DISEASES, B (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hæmorrhagie | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 1 |
| Scurvy | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| *Anæmia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 1 | 11 | .. | .. | 1 | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 17 | .. | .. |
| Chlorosis | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| *General Dropsy | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| **LOCAL DISEASES.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **DISEASES OF THE NERVOUS SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **DISEASES OF THE BRAIN AND ITS MEMBRANES.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Encephalitis | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 |
| Meningitis (simplex) | 1 | .. | 2 | 1 | .. | 1 | 1 | .. | .. | .. | 1 | .. | 1 | .. | 1 | 1 | 1 | .. | .. | 2 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 1 | 6 | 4 |
| Softening | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Abscess | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| Apoplexy—Sanguineous | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 1 | .. | 5 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 10 | .. |
| Sunstroke | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE NERVOUS SYSTEM (*contd.*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chronic Hydrocephalus .. .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 |
| Tumour .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. |
| Cerebral Affection | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| DISEASES OF THE SPINAL CORD AND ITS MEMBRANES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation—Myelitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 2 | 1 |
| DISEASES OF THE NERVES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Paralysis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hemiplegia .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 5 | 5 | .. | .. | 3 | 3 | .. | .. | 2 | 7 | .. | .. | 9 | 2 | .. | .. | 6 | 2 | .. | .. | 2 | 1 | .. | .. | 28 | 20 | .. | .. |
| Paraplegia .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | 1 | .. | 1 | 2 | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 9 | 4 | .. | .. |
| Locomotor Ataxy | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. | .. |
| Infantile Paralysis | 3 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 1 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| **DISEASES OF THE NERVOUS SYSTEM (*contd.*)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Local Paralysis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Facial Paralysis | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Other Paralyses | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | .. | .. |
| **Functional Diseases of the Nervous System.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tetanus .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Infantile Convulsions .. .. | 1 | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | .. |
| Epilepsy .. .. | .. | 1 | .. | .. | .. | 3 | .. | .. | 3 | 2 | .. | .. | 2 | 2 | .. | .. | 3 | 7 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | 2 | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 12 | 17 | 1 | .. |
| Epileptic Vertigo | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. |
| Convulsions .. | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. |
| Laryngismus .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Spasm of Muscles | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Paralysis Agitans | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Chorea .. .. | .. | .. | .. | .. | 2 | 6 | .. | .. | 6 | 17 | .. | .. | 1 | 6 | .. | 1 | .. | 3 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 11 | 32 | .. | 1 |
| Hysteria .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 6 | .. | .. | .. | 14 | .. | .. | 1 | 12 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 36 | .. | .. |
| Hysterical Paralysis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE NERVOUS SYSTEM (*contd.*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Neuralgia— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Various .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| Brow Ague .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Sciatica .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | .. | .. |
| Pleurodynia .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | .. |
| Hypochondriasis . | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. |
| Various Nerve Disorders .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 3 | 1 | .. | .. | 6 | 2 | .. | .. | 1 | 3 | .. | .. | 1 | .. | .. | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 13 | 8 | .. | 1 |
| DISORDERS OF THE INTELLECT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mania .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. |
| Melancholia .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 3 | .. | .. |
| Dementia .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 4 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| **DISEASES OF THE CIRCULATORY SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE HEART AND ITS MEMBRANES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Diseases of the Pericardium.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pericarditis .. | .. | .. | .. | 1 | 2 | .. | .. | 1 | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. | 4 |
| Adherent Pericardium .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| *Diseases of the Endocardium.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Valve Disease— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Aortic .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 3 | 2 | 2 | .. | 4 | .. | 2 | .. | 2 | 1 | 1 | .. | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 10 | 5 | 6 | .. |
| 2. Mitral .. | .. | .. | .. | .. | .. | 1 | 1 | .. | 1 | 5 | 1 | .. | 3 | 3 | 3 | .. | 3 | 10 | 2 | 5 | 6 | 5 | .. | 1 | 1 | 6 | .. | 2 | .. | 2 | .. | 2 | 1 | 1 | 1 | 2 | .. | .. | .. | 15 | 33 | 8 | 12 |
| 3. Tricuspid .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 |
| 4. Complicated .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | .. | 2 | 3 | 4 | .. | 4 | 3 | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 7 | 5 | 2 |
| 5. Congenital .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE CIRCULATORY SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Diseases of the Muscular Structure of the Heart.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dilatation.. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | .. |
| Fatty Degeneration | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | 1 |
| *Angina Pectoris .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| DISEASES OF THE BLOOD VESSELS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Diseases of the Arteries.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fibrosis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Aneurism— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| of Aorta .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 3 | .. | 1 | .. | 2 | 1 | 3 | 2 | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 6 | 1 | 6 | 2 |
| of Innominate .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Rupture .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| **DISEASES OF THE CIRCULATORY SYSTEM (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aneurism (*cntd.*) — of Abdominal Arteries .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Epigastric Pulsation .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| *Diseases of the Veins.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phlebitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 |
| Phlegmasia Dolens .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| Obstruction .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 1 | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 3 | 2 | .. | 2 |
| **DISEASES OF THE ABSORBENT SYSTEM.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hypertrophy of Glands .. .. | .. | 1 | 1 | .. | 2 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 2 | 4 | 1 | 1 |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF DUCTLESS GLANDS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE THYROID GLAND. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hypertrophy .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Exophthalmic Bronchocele .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | **1** | .. | 6 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | .. | **1** |
| DISEASES OF THE SUPRA-RENAL CAPSULES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Addison's Disease . | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. |
| DISEASES OF THE RESPIRATORY SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE RESPIRATORY SYSTEM NOT SIMPLY LOCAL. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Croup .. .. | 2 | .. | **3** | **3** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | **3** | **3** |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE RESPIRATORY SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE LARYNX. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Laryngeal Catarrh. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Laryngitis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acute .. .. | 1 | 1 | .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | 1 | 2 |
| Chronic .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| DISEASES OF THE TRACHEA AND BRONCHI. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bronchial Catarrh | 4 | 2 | .. | .. | 2 | 2 | .. | .. | 1 | 3 | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. | 2 | 2 | .. | .. | .. | .. | 1 | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 9 | 15 | 1 | .. |
| Bronchitis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acute .. .. | 5 | 3 | .. | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. | 3 | 2 | .. | .. | 2 | 4 | 1 | .. | .. | 1 | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 12 | 12 | 2 | 3 |
| Chronic .. .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | 1 | 2 | .. | .. | 2 | 8 | 1 | .. | 9 | 4 | .. | 3 | 10 | 15 | 4 | 5 | 6 | 3 | 1 | 2 | 4 | 2 | 2 | 1 | .. | .. | 1 | .. | 33 | 34 | 10 | 11 |
| Asthma .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharged. | | Died. | | Discharge | | 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 | M | F |
| **DISEASES OF THE RESPIRATORY SYSTEM (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE LUNG. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pneumonia .. | 7 | 3 | **2** | .. | 7 | 6 | .. | .. | 6 | 1 | .. | **1** | 8 | 2 | .. | **1** | 13 | 5 | **2** | **1** | 8 | 2 | **3** | .. | 2 | 3 | **3** | .. | .. | .. | .. | .. | .. | **1** | .. | .. | .. | .. | 51 | 22 | **11** | **3** |
| Lobular .. .. | 1 | .. | .. | **2** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | **2** |
| Pleuro-pneumonia. | 1 | .. | **2** | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | 3 | **1** | .. | 5 | .. | .. | .. | 2 | 1 | .. | **1** | 3 | .. | **1** | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 14 | 5 | **4** | **1** |
| Gangrene .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. |
| *Hæmoptysis .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. | 3 | 2 | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | 2 | **1** | .. |
| Cirrhosis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | **1** |
| Emphysema .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. | 1 | 1 | **2** | **1** | .. | .. | .. | **4** | .. | .. | **1** | .. | .. | .. | **1** | .. | .. | .. | 1 | 1 | **4** | **6** |
| *Collapse .. .. | .. | .. | .. | **1** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** |
| DISEASES OF THE PLEURA. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pleurisy .. .. | .. | .. | **1** | .. | 2 | 2 | .. | **1** | 2 | 2 | **1** | **1** | 2 | 3 | .. | **1** | 14 | 7 | .. | **1** | 4 | 1 | .. | .. | 4 | 1 | **2** | .. | 3 | .. | **2** | .. | 1 | .. | .. | .. | .. | .. | 32 | 16 | **6** | **4** |
| Sequelæ of Pleurisy | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | .. |
| Empyema.. .. | .. | 2 | **1** | .. | .. | .. | **1** | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. | .. | .. | 3 | 2 | **3** | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE RESPIRATORY SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE MEDIASTINUM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tumour .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | 1 | .. |
| DISEASES OF THE DIGESTIVE SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE ŒSOPHAGUS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Stricture .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .... | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| Dysphagia.. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| DISEASES OF THE STOMACH. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gastritis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 3 | .. | .. |
| Chronic Ulcer .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 2 | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 5 | 1 | 1 |
| *Hæmatemesis .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 2 | .. | .. |
| *Stricture .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Dyspepsia .. .. | .. | .. | .. | .. | 2 | 2 | .. | .. | 1 | .. | .. | .. | .. | 3 | .. | .. | 2 | 6 | .. | .. | .. | 1 | .. | .. | 1 | 2 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 6 | 17 | .. | .. |
| Gastrodynia .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| *Vomiting .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | 3 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE DIGESTIVE SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE INTESTINES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Enteritis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 3 | .. | .. |
| Typhlitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | 1 |
| Dysentery .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | 1 |
| Ulceration .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Perforation .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Inflammation of the Sub-peritoneal Tissue .. .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | .. | .. |
| Melæna .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| *Tympanites .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| *Obstruction .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | 1 |
| Internal Strangulation .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 |
| Diarrhœa .. .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 6 | .. | .. |
| Colic .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Constipation .. | .. | .. | .. | .. | .. | 3 | .. | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. | 2 | 1 | .. | .. | .. | 2 | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 5 | 11 | .. | .. |
| Diarrhœa and Vomiting .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 1 |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE DIGESTIVE SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE LIVER. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatitis | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| Abscess | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | 1 | | | | | | | | | | | | 2 | | 2 | |
| Cirrhosis | | | | | | | | | | | | | | | | | 1 | | | | 2 | 2 | 2 | | 1 | 1 | 3 | | 1 | 3 | 1 | 1 | | 1 | | | | | | | 5 | 7 | 6 | 1 |
| Fatty Liver | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lardaceous Liver | | | | | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | 1 | |
| Parasitic Disease—Echinococcus hominis | | | | | 1 | | | | | | | | | | | | | | 1 | | | | 1 | | | | 1 | | | | | | | | | | | | | | | |
| Jaundice | | | | | | | | | | | | | 1 | | | | 2 | 1 | | | | 2 | | | 1 | 2 | | | 2 | 2 | | | | | | | | | | | 1 | 2 | 1 | 1 |
| Enlargement | | | | | | | | | | | | | | | | | | 2 | | | 1 | | | | | | | | | | | | | | | | | | | | 6 | 7 | 1 | |
| DISEASES OF THE HEPATIC DUCT & GALL BLADDER. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | | |
| Perforation | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gall Stones | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | | | 1 | | | | 1 | | | | | | | | | | | 1 | 3 | | |
| DISEASES OF THE SPLEEN. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hypertrophy | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| Leucocythæmia | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 | | | | | 1 | | | | | | | | | 1 | 1 | 1 |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE DIGESTIVE SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE PERITONEUM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Peritonitis .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | 3 | .. | .. | .. | 1 | 1 | 1 | .. | .. | 2 | 2 | 1 | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 5 | 4 | 4 |
| *Ascites .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 3 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 3 | 4 | 1 | .. |
| Tumours .. .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. | 1 | 5 | .. | .. | 3 | 5 | .. | .. | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | 17 | .. | .. |
| DISEASES OF THE URINARY SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE KIDNEY. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bright's Disease— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Acute .. | 1 | .. | 1 | .. | 3 | .. | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | 3 | 2 | 2 | 1 | .. | 2 | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 10 | 5 | 4 | 1 |
| 2. Chronic .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | 2 | 1 | .. | 1 | 2 | 4 | 8 | 3 | 9 | 7 | 2 | 6 | 8 | 8 | 4 | 4 | 2 | 2 | 2 | 2 | .. | 1 | 1 | 4 | .. | .. | .. | .. | 25 | 23 | 18 | 20 |
| Abscess .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE URINARY SYSTEM (*contd.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pyelitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| Calculus .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. |
| *Hæmaturia Renalis .. .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | 1 | .. | .. |
| *Hæmatinuria .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| *Diuresis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| DISEASES OF THE BLADDER. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Hæmaturia (Vesical) .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE GENERATIVE SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE FEMALE ORGANS OF GENERATION IN THE UNIMPREGNATED STATE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE OVARY. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 9 | .. | .. | .. | 6 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 16 | .. | .. |
| Abscess .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 |
| DISEASES OF THE BROAD LIGAMENT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pelvic Peritonitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 11 | .. | .. | .. | 7 | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 20 | .. | 1 |
| Pelvic Cellulitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | .. | .. | .. | 3 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 11 | .. | 1 |
| Abscess .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 4 | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | .. | 1 |
| Pelvic Hæmatocele .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 1 | .. | 1 | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | .. | 1 |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE GENERATIVE SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE UTERUS, INCLUDING THE CERVIX. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Catarrh .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Endometritis .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| Congestion .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Hypertrophy .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | .. |
| Non-Malignant Tumour— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Fibrous Tumour.. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. | .. | 5 | .. | .. | .. | 10 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 22 | .. | 1 |
| B. Polypus .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. |
| DISPLACEMENTS AND DISTORTIONS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Retroversion.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| B. Anteflexion .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |

TABLE II (*continued*).

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE GENERATIVE SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISPLACEMENTS AND DISTORTIONS. (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. Retroflexion | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| d. Prolapsus | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Procidentia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 4 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 8 | .. | 1 |
| MALFORMATIONS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Absence of uterus | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| DISEASES OF THE VAGINA. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 5 | .. | .. | .. | 4 | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 14 | .. | .. |
| Cicatrix | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Hernia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Laceration | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Malformations | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Diseases of Vulva | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Inflammation of Labia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Abscess | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Hypertrophy of Labia | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Persistent Hymen | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE GENERATIVE SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF THE VULVA. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tumour of Vulva | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Tumour of Urethra | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Mucous Cyst | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Malformation of Urethra | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Verrucæ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| FUNCTIONAL DISEASES OF THE FEMALE ORGANS OF GENERATION. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Amenorrhœa | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Dysmenorrhœa | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | .. |
| *Hæmorrhage | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. | .. | 7 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 13 | .. | .. |

TABLE II (*continued*).

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| AFFECTIONS CONNECTED WITH PREGNANCY. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pregnancy .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| DISORDERS OF THE DIGESTIVE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nausea & Vomiting | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| DISORDERS OF THE URINARY SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Albuminuria .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| DISORDERS OF THE GENERATIVE SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hæmorrhage .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Displacements of the Uterus— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Retroversion .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. |
| Abortion .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 4 | .. | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 9 | .. | .. |
| Extrauterine Gestation .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Vesicular Mole .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| AFFECTIONS CONNECTED WITH PARTURITION. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hæmorrhage (after Abortion) .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| AFFECTIONS CONNECTED WITH PREGNANCY (*contd.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Retention of part of Ovum.. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| AFFECTIONS CONSEQUENT ON PARTURITION. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Subinvolution .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| Occlusion of os uteri | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| DISEASES OF THE ORGANS OF LOCOMOTION. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DISEASES OF BONES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mollities Ossium.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| DISEASES OF THE MUSCLES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Progressive Muscular Atrophy.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 2 | 1 | .. | 1 |

TABLE II (*continued*).

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF CELLULAR TISSUE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Obesity .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| DISEASES OF THE CUTANEOUS SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Erythema— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E. Lævo.. .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 4 | .. | .. |
| E. Nodosum .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| Roscola .. .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | .. |
| Urticaria .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. |
| Lichen .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Psorinsis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Lepra Anæsthetica | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Herpes .. .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. |
| Pemphigus .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Eczema— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E. Simplex .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 4 | .. | .. |
| E. Exfoliativum | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| E. Chronicum .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | 1 | 2 | .. | .. | 1 | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 8 | 5 | .. | .. |
| Impetigo .. .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Ecthyma .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Ichthyosis .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Acne .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Boils .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Nævus Pilaris .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE CUTANEOUS SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PARASITIC DISEASE OF THE SKIN. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Favus .. .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Scabies .. .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| **CONDITIONS NOT NECESSARILY ASSOCIATED WITH GENERAL OR LOCAL DISEASES.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Debility .. .. | 1 | 3 | .. | .. | 4 | 2 | .. | .. | 1 | 2 | .. | .. | 2 | 1 | .. | .. | 6 | 20 | .. | .. | 4 | 11 | .. | .. | .. | 9 | .. | .. | .. | 4 | .. | .. | 2 | 2 | .. | .. | .. | 1 | .. | .. | 20 | 55 | .. | .. |
| Pain .. .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | 3 | .. | .. | .. | 4 | .. | .. | 1 | 3 | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 5 | 14 | .. | .. |
| Unknown.. .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| CONDITIONS NOT NECESSARILY ASSOCIATED, &c. (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Malingering .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Nil .. .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 4 | .. | .. |
| POISONS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| METALS AND THEIR SALTS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lead— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lead Colic .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 4 | .. | .. |
| Lead Palsy .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Silver— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Silver Stain .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| CAUSTIC ALKALIES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Potash .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–20. | | | | 20— | | | | 30— | | | | 40— | | | | 50— | | | | 60— | | | | 70 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| POISONS (*contd.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acids. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sulphuric Acid .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | **1** | .. |
| Carbolic Acid .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Oxalic Acid .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Vegetable Poisons. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Opium .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| Intoxication .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | .. | .. |
| Delirium tremens | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 7 | 1 | **2** | .. | 8 | 1 | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 18 | 3 | **2** | .. |
| Belladonna .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Calabar Bean .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Gaseous Poisons. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sewer Gas .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |

# TABLE III.

*Showing the Effects of Season on the Frequency and Fatality of some of the Principal Diseases.*

| DISEASES. | Jan. | | Feb. | | March. | | April. | | May. | | June. | | July. | | Aug. | | Sept. | | Oct. | | Nov. | | Dec. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. | Admitted. | Died. |
| Measles .. .. .. | 1 | .. | .. | .. | 5 | **1** | 3 | .. | 4 | **1** | 1 | .. | 4 | .. | 4 | .. | 2 | .. | 1 | .. | 2 | **1** | 4 | **1** |
| Scarlet Fever and Sequelæ.. | 6 | .. | 7 | **2** | 6 | .. | 11 | **1** | 11 | **1** | 8 | **2** | 9 | **1** | 11 | .. | 10 | **5** | 16 | **2** | 8 | .. | 5 | **1** |
| Enteric Fever and Sequelæ . | 4 | **2** | 2 | .. | 2 | .. | 5 | .. | 5 | .. | 5 | **2** | 10 | **2** | 9 | .. | 25 | **1** | 20 | **4** | 6 | **3** | 7 | **1** |
| Diphtheria .. .. .. | 1 | .. | 3 | **2** | .. | .. | 1 | .. | 1 | .. | 3 | **2** | 1 | **1** | .. | .. | .. | .. | .. | .. | 2 | **2** | 2 | **2** |
| Hooping Cough .. .. | .. | .. | 3 | .. | 1 | **1** | 4 | **1** | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | **1** | 3 | .. | .. | **1** | 1 | .. |
| Rheumatism— | | | | | | | | | | | | | | | | | | | | | | | | |
| Acute .. .. .. | 14 | .. | 13 | .. | 11 | **1** | 12 | .. | 8 | .. | 6 | **1** | 10 | .. | 10 | .. | 13 | **1** | 15 | **1** | 15 | .. | 6 | .. |
| Subacute.. .. .. | 2 | .. | 2 | .. | 2 | .. | .. | .. | 8 | .. | 2 | .. | 5 | .. | 2 | .. | 2 | .. | .. | .. | 2 | .. | 4 | .. |
| Croup .. .. .. | 1 | **1** | .. | .. | .. | .. | .. | .. | .. | .. | 3 | **1** | .. | .. | .. | .. | 1 | **1** | 2 | **2** | .. | .. | 1 | **1** |
| Bronchial Catarrh .. .. | 2 | .. | .. | .. | 4 | .. | 2 | .. | 2 | **1** | 2 | .. | 2 | .. | 2 | .. | 1 | .. | 4 | .. | 2 | .. | 2 | .. |
| Bronchitis— | | | | | | | | | | | | | | | | | | | | | | | | |
| Acute .. .. .. | 3 | .. | 2 | .. | 3 | .. | 1 | .. | 3 | .. | 1 | .. | 2 | **1** | 2 | .. | 2 | .. | 2 | .. | 4 | **3** | 1 | **1** |
| Chronic .. .. .. | 11 | **2** | 11 | **2** | 11 | **5** | 8 | **3** | 10 | **3** | 5 | **1** | 2 | **1** | 1 | .. | 2 | .. | 5 | .. | 9 | | 13 | **2** |
| Pneumonia .. .. .. | 3 | **2** | 4 | **1** | 17 | **3** | 12 | **4** | 11 | **2** | 10 | **1** | 3 | .. | 5 | .. | 7 | **1** | 4 | .. | 4 | .. | 2 | .. |
| Lobular .. .. .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 2 | **2** | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. |
| Pleuropneumonia .. .. | 4 | **1** | 3 | .. | 2 | .. | 3 | .. | 2 | .. | .. | .. | 1 | **1** | .. | .. | 1 | .. | 2 | **2** | 4 | **1** | 2 | .. |
| Pleurisy .. .. .. | 5 | .. | 4 | **1** | 10 | **2** | 6 | .. | 3 | **2** | 4 | .. | 7 | **1** | 6 | **1** | 4 | **1** | 5 | **1** | 2 | .. | 2 | **1** |
| Empyema .. .. .. | .. | .. | 1 | .. | .. | **1** | 2 | .. | .. | **1** | 2 | .. | 2 | **1** | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| Bright's Disease— | | | | | | | | | | | | | | | | | | | | | | | | |
| Acute .. .. .. | .. | .. | .. | **1** | 2 | .. | 2 | **1** | 2 | **1** | 2 | .. | 3 | .. | 1 | .. | 3 | **1** | 3 | .. | 1 | **7** | 2 | .. |
| Chronic .. .. .. | 7 | **2** | 6 | **3** | 8 | **3** | 6 | .. | 10 | **2** | 8 | **6** | 9 | **4** | 6 | **3** | 4 | **3** | 8 | **2** | 6 | **1** | 5 | **3** |

## *Table showing the Average Stay of the Medical Cases in Hospital, &c.*

| Within—Weeks of admission. | Discharged. | | Died. | | Deaths within 1 week of admission. | | | |
|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | Day. | M. | F. | Total. |
| 1 | 71 | 78 | | | 1 | 10 | 4 | 14 |
| 2 | 110 | 216 | 41 | 50 | 2 | 11 | 17 | 28 |
| 3 | 133 | 216 | 30 | 20 | 3 | 18 | 17 | 35 |
| 4 | 108 | 154 | 14 | 15 | 4 | 17 | 9 | 26 |
| 5 | 118 | 120 | 11 | 13 | 5 | 8 | 6 | 14 |
| 6 | 64 | 77 | 15 | 3 | 6 | 8 | 13 | 21 |
| 7 | 63 | 64 | 8 | 10 | 7 | 6 | 9 | 15 |
| 8 | 35 | 43 | 5 | 6 | | 78 | 75 | 153 |
| 9 | 32 | 35 | 2 | 2 | | 153 | | |
| 10 | 17 | 27 | 7 | 1 | | | | |
| 11 | 11 | 15 | 1 | 3 | | | | |
| 12 | 7 | 10 | 3 | 1 | | | | |
| 13 | 5 | 10 | 1 | 1 | | | | |
| 14 | 8 | 8 | 2 | .. | | | | |
| 15 | 4 | 4 | .. | 2 | | | | |
| 16 | .. | .. | 1 | .. | | | | |
| 17 | 6 | .. | .. | 1 | | | | |
| 18 | 6 | 2 | 1 | .. | | | | |
| 19 | 5 | 4 | 1 | .. | | | | |
| 20 | 2 | 1 | 1 | 1 | | | | |
| 21 | 2 | 1 | .. | .. | | | | |
| 22 | 1 | 2 | .. | .. | | | | |
| 23 | .. | 1 | 1 | 1 | | | | |
| 24 | .. | .. | 1 | .. | | | | |
| 27 | .. | 3 | .. | .. | | | | |
| 31 | 1 | .. | .. | .. | | | | |
| 48 | .. | 1 | .. | .. | | | | |

### DEATHS.

The total number of *Deaths* during the year was .. .. .. 412

Of these there occurred within 24 hours of admission .. .. 14 = 3 per cent.

Within one week of admission .. 153 = 37 „

„ a fortnight „ .. 244 = 59 „

„ three weeks „ .. 294 = 71 „

„ a month „ .. 323 = 78 „

The average time of fatal cases in Hospital was in days .. .. .. .. } 21

### DISCHARGES.

| | | |
|---|---|---|
| The total number of *Discharges* during the year was .. .. .. .. .. .. | 1,905 | |
| Of these, the number discharged within 24 hours was .. .. .. .. .. | 4 = 21 | per cent. |
| Within 1 week .. .. .. .. .. | 149 = 7 | „ |
| „ 2 weeks .. .. .. .. .. | 475 = 24 | „ |
| „ 3 „ .. .. .. .. .. | 824 = 43 | „ |
| „ 4 „ .. .. .. .. .. | 1,086 = 57 | „ |
| „ 5 „ .. .. .. .. .. | 1,324 = 69 | „ |
| „ 6 „ .. .. .. .. .. | 1,465 = 76 | „ |
| The average stay in Hospital of patients discharged was, in days .. .. .. | 31 | |

### PERNOCTATIONS.

There are 230 beds in the Medical Wards, giving the number of possible pernoctations for the year, 230 × 365, or 83,950; but of the 10 Medical Wards, 2 were closed during a portion of the year. This would take away about 245 pernoctations, leaving .. .. .. .. .. 83,705

The actual number of pernoctations has been as follows:—

| | | |
|---|---|---|
| Of cases admitted in 1878 or 1879 and discharged during 1879.. .. .. .. | 60,892 | |
| Of cases remaining in at the end of the year 1879 | 7,287 | |
| Of fatal cases .. .. .. .. .. | 8,850 | |
| | | 77,029 |
| Giving a difference of .. .. .. .. | | 6,676 |

This gives a nightly average of about 17 empty beds.

# SURGICAL REPORT.

# TABLE I.

*Showing the Total Number of Cases of each Disease under Treatment during the Year* 1879, *with the Results.*

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **General Diseases.** | | | | | | | | | | |
| Equinia | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Phagedæna | 2 | 3 | 2 | 2 | .. | .. | .. | 1 | .. | .. |
| Tetanus | 2 | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Erysipelas— | | | | | | | | | | |
| *a.* Simple | 17 | 8 | 15 | 6 | .. | .. | .. | 1 | 2 | 1 |
| *b.* Phlegmonous | 23 | 4 | 18 | 4 | .. | .. | 3 | .. | 2 | .. |
| *c.* Diffuse Inflammation | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Pyæmia { Acute | 4 | 3 | 1 | 1 | .. | .. | 3 | 2 | .. | .. |
| Pyæmia { Chronic | 2 | 1 | .. | 1 | .. | .. | .. | .. | 2 | .. |
| Syphilis— | | | | | | | | | | |
| A. Soft Chancre | 43 | 25 | 38 | 23 | .. | .. | .. | .. | 5 | 2 |
| Phagedænic Sore | 2 | 3 | 2 | 3 | .. | .. | .. | .. | .. | .. |
| Hard Sore | 18 | 17 | 18 | 14 | .. | .. | .. | .. | .. | 3 |
| B. Secondary Syphilis— | | | | | | | | | | |
| Local Syphilitic Affections— | | | | | | | | | | |
| Palate and Pharynx | .. | 3 | .. | 2 | .. | .. | .. | .. | .. | 1 |
| Larynx | 2 | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| Rectum | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | 1 |
| Bone | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | 1 |
| Skin | 36 | 34 | 33 | 31 | .. | .. | .. | .. | 3 | 3 |
| Testis | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Penis | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| C. Tertiary Ulcers and Eruptions | 22 | 24 | 19 | 22 | .. | .. | 2 | .. | 1 | 2 |
| D. Hereditary Syphilis | 1 | 2 | .. | 1 | .. | 1 | 1 | .. | .. | .. |
| Cancer— | | | | | | | | | | |
| A. Scirrhus— | | | | | | | | | | |
| Rectum | 4 | 2 | 2 | 1 | 1 | 1 | 1 | .. | .. | .. |
| Female Breast | .. | 51 | .. | 33 | .. | 13 | .. | 2 | .. | 3 |
| Glands | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| B. Medullary Cancer— | | | | | | | | | | |
| Testis | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| GENERAL DISEASES (*continued*). | | | | | | | | | | |
| Cancer (*continued*)— | | | | | | | | | | |
| Upper Jaw | .. | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. |
| Glands | 2 | .. | .. | .. | 1 | .. | 1 | .. | .. | .. |
| Bladder | 2 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. |
| Foot | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. |
| c. Epithelial Cancer— | | | | | | | | | | |
| Intestine | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. |
| Cicatrices | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Ear | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| Lip | 13 | .. | 11 | .. | 2 | .. | .. | .. | .. | .. |
| Tongue | 18 | 2 | 14 | 1 | 3 | 1 | 1 | .. | .. | .. |
| Mouth and Jaw | 5 | .. | 2 | .. | 3 | .. | .. | .. | .. | .. |
| Face | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Vulva | .. | 5 | .. | 2 | .. | 2 | .. | 1 | .. | .. |
| Scrotum | 4 | .. | 3 | .. | .. | .. | .. | .. | 1 | .. |
| Penis | 3 | .. | 1 | .. | 2 | .. | .. | .. | .. | .. |
| Chest | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Eyelid | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Rectum | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| Nose | 1 | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. |
| Pharynx | .. | 3 | .. | 1 | .. | 1 | .. | .. | .. | 1 |
| Lupus | .. | 7 | .. | 7 | .. | .. | .. | .. | .. | .. |
| Rodent Ulcer | 5 | 1 | 5 | 1 | .. | .. | .. | .. | .. | .. |
| Scrofula | | | | | | | | | | |
| Testicle | 5 | .. | 5 | .. | .. | .. | .. | .. | .. | .. |
| Skin | 5 | 2 | 5 | 2 | .. | .. | .. | .. | .. | .. |
| Tongue | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Bone | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Hysteria | 2 | 5 | 1 | 5 | 1 | .. | .. | .. | .. | .. |
| DISEASES OF THE EYE. | | | | | | | | | | |
| A. Conjunctiva— | | | | | | | | | | |
| Catarrhal Ophthalmia | 5 | 2 | 5 | 2 | .. | .. | .. | .. | .. | .. |
| Purulent Infantile | 5 | .. | 5 | .. | .. | .. | .. | .. | .. | .. |
| Gonorrhœal | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Phlyctenular | 2 | 1 | 1 | 1 | .. | .. | .. | .. | 1 | .. |
| Rheumatic | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Pterygium | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| B. Cornea— | | | | | | | | | | |
| Fistula | 2 | 1 | 1 | .. | .. | .. | .. | .. | 1 | 1 |
| Keratitis | 5 | 17 | 5 | 17 | .. | .. | .. | .. | .. | .. |
| Do. Interstitial | 4 | 7 | 4 | 7 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE EYE (*continued*). | | | | | | | | | | |
| B. Cornea (*continued*)— | | | | | | | | | | |
| Hypopyon | 2 | 1 | 2 | 1 | .. | .. | .. | .. | .. | .. |
| Ulcers | 14 | 11 | 14 | 11 | .. | .. | .. | .. | .. | .. |
| Opacity | 6 | 3 | 6 | 3 | .. | .. | .. | .. | .. | .. |
| Staphyloma | 6 | 3 | 6 | 3 | .. | .. | .. | .. | .. | .. |
| C. Iris— | | | | | | | | | | |
| Iritis | 13 | 6 | 12 | 5 | 1 | .. | .. | .. | .. | 1 |
| Rheumatic Iritis | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Synechia | 5 | 13 | 5 | 11 | .. | 1 | .. | .. | .. | 1 |
| Occluded Pupil | 2 | 1 | 2 | .. | .. | 1 | .. | .. | .. | .. |
| D. Crystalline Lens— | | | | | | | | | | |
| Cataract— | | | | | | | | | | |
| Hard | 22 | 12 | 19 | 11 | 2 | .. | .. | .. | 1 | 1 |
| Soft | 2 | 1 | 2 | 1 | .. | .. | .. | .. | .. | .. |
| Traumatic | 12 | .. | 9 | .. | 2 | .. | .. | .. | 1 | .. |
| Congenital | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| Opaque Capsule | 6 | .. | 5 | .. | 1 | .. | .. | .. | .. | .. |
| E. Diseases of Retina and Optic Nerve— | | | | | | | | | | |
| Glioma | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Optic Neuritis | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Retino-Choroiditis | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| White Atrophy of Optic Disc | 2 | 1 | .. | .. | 2 | 1 | .. | .. | .. | .. |
| F. Diseases of the Choroid— | | | | | | | | | | |
| Choroiditis | 1 | 2 | 1 | 2 | .. | .. | .. | .. | .. | .. |
| G. Diseases of Vitreous— | | | | | | | | | | |
| Hæmorrhage into Vitreous | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| H. General Affections of the Eye— | | | | | | | | | | |
| Glaucoma | 10 | 19 | 8 | 16 | 1 | 1 | .. | 1 | 1 | 1 |
| Sympathetic Ophthalmia | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Sarcoma | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Shrivelled Globe | 4 | 2 | 4 | 2 | .. | .. | .. | .. | .. | .. |
| Tumours | .. | 3 | .. | 1 | .. | 2 | .. | .. | .. | .. |
| Amaurosis | .. | 3 | .. | .. | .. | 2 | .. | .. | .. | 1 |
| I. Strabismus— | | | | | | | | | | |
| Internal | 24 | 19 | 22 | 17 | 1 | 2 | .. | .. | 1 | .. |
| External | 2 | 2 | 2 | 2 | .. | .. | .. | .. | .. | .. |
| J. Hypermetropia and Asthenopia | | | | | | | | | | |
| Hypermetropia | 3 | 3 | 3 | 3 | .. | .. | .. | .. | .. | .. |
| Astigmatism | 1 | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. |
| Myopia | .. | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. |
| Amblyopia | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| K. Diseases of the Lachrymal Apparatus— | | | | | | | | | | |
| Lachrymal Obstruction | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| DISEASES OF THE EYE (*continued*). | | | | | | | | | | |
| K. Diseases of the Lachrymal Apparatus (*continued*)— | | | | | | | | | | |
| Dacryo-Cystitis .. .. | 2 | 2 | 2 | 2 | .. | .. | .. | .. | .. | .. |
| Fistula .. .. .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| L. Diseases of the Eyelids— | | | | | | | | | | |
| Entropion .. .. .. | 1 | 5 | .. | 5 | 1 | .. | .. | .. | .. | .. |
| Ectropion .. .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Granular Lids .. .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| Symblepharon .. .. | 2 | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| Tarsal Tumor .. .. | .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. |
| Ptosis .. .. .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| Trichiasis .. .. .. | 1 | 3 | 1 | 3 | .. | .. | .. | .. | .. | .. |
| M. Diseases of Orbit— | | | | | | | | | | |
| Tumor .. .. .. | 3 | .. | 2 | .. | .. | .. | .. | .. | 1 | .. |
| DISEASES OF THE EAR. | | | | | | | | | | |
| Otorrhœa .. .. .. | 1 | 2 | 1 | 1 | .. | .. | .. | 1 | .. | .. |
| Otitis Interna .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| DISEASES OF THE NOSE. | | | | | | | | | | |
| Growth from Septum .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Polypus .. .. .. .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Epistaxis .. .. .. .. | 6 | 4 | 6 | 4 | .. | .. | .. | .. | .. | .. |
| Ozœna .. .. .. .. | .. | 4 | .. | 2 | .. | 1 | .. | .. | .. | 1 |
| Lipoma .. .. .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Ulceration .. .. .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| DISEASES OF THE CIRCULATORY AND ABSORBENT SYSTEMS. | | | | | | | | | | |
| Aneurism— | | | | | | | | | | |
| Subclavian Artery .. .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| By Anastomosis .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Popliteal .. .. | 5 | .. | 4 | .. | .. | .. | 1 | .. | .. | .. |
| Aortic Aneurism .. .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| Varicose Veins .. .. .. | 3 | 4 | 3 | 3 | .. | .. | .. | .. | .. | 1 |
| Blood Tumor .. .. .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Hæmorrhagic Diathesis .. .. | .. | 2 | .. | 1 | .. | .. | .. | 1 | .. | .. |
| Phlebitis .. .. .. .. | 2 | 8 | 2 | 4 | .. | .. | .. | 2 | .. | 2 |
| Chilblain .. .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Lymphatic Glands— | | | | | | | | | | |
| Abscess .. .. .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 |
| Enlarged Glands .. .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Lymphangitis .. .. | 3 | 3 | 2 | 3 | 1 | .. | .. | .. | .. | .. |
| DISEASES OF THE LIPS. | | | | | | | | | | |
| Nævus .. .. .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE LIPS (*continued*).** | | | | | | | | | | |
| Malformations— | | | | | | | | | | |
| Deformity of Lip | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Single Harelip | 6 | 2 | 6 | 2 | .. | .. | .. | .. | .. | .. |
| Double „ | 1 | 2 | 1 | 2 | .. | .. | .. | .. | .. | .. |
| Carbuncle | 3 | 1 | 2 | .. | .. | .. | 1 | .. | .. | 1 |
| Ulcer | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| **DISEASES OF MOUTH AND CHEEK.** | | | | | | | | | | |
| Congenital Deformity | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Abscess | .. | 4 | .. | 4 | .. | .. | .. | .. | .. | .. |
| Sarcoma | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Cancrum Oris | 3 | .. | .. | .. | .. | .. | 3 | .. | .. | .. |
| Stomatitis | 1 | 4 | 1 | 3 | .. | .. | .. | 1 | .. | .. |
| Ulcer | 1 | 1 | 1 | .. | .. | .. | .. | 1 | .. | .. |
| **DISEASES OF GUMS AND JAWS.** | | | | | | | | | | |
| Ankylosis | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. |
| Necrosis | 4 | 4 | 3 | 4 | 1 | .. | .. | .. | .. | .. |
| Epulis | .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. |
| Dental Abscess | .. | 4 | .. | 4 | .. | .. | .. | .. | .. | .. |
| Sarcoma | 2 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. |
| Stiff Jaw | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Enchondroma of Upper Jaw | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| **DISEASES OF PALATE AND FAUCES.** | | | | | | | | | | |
| Enlarged Thyroid | 1 | 2 | .. | 1 | 1 | 1 | .. | .. | .. | .. |
| Enlarged Tonsils | 1 | 7 | 1 | 7 | .. | .. | .. | .. | .. | .. |
| Tonsillitis | 8 | 23 | 8 | 23 | .. | .. | .. | .. | .. | .. |
| Cleft Palate | 10 | 9 | 10 | 7 | .. | 1 | .. | .. | .. | 1 |
| Abscess, Retro-Pharyngeal | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Perforation of Palate | 1 | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. |
| **DISEASES OF SALIVARY GLANDS.** | | | | | | | | | | |
| Parotid Glandular Tumour | 5 | 1 | 3 | 1 | 1 | .. | .. | .. | 1 | .. |
| Adeno-fibroma of Submaxillary Gland | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Calculus | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| **DISEASES OF THE INTESTINES.** | | | | | | | | | | |
| Hernia— | | | | | | | | | | |
| Umbilical | 1 | 2 | 1 | 2 | .. | .. | .. | .. | .. | .. |
| Inguinal | 27 | 1 | 22 | 1 | .. | .. | 4 | .. | 1 | .. |
| Femoral | 8 | 28 | 5 | 23 | .. | .. | 3 | 4 | .. | 1 |
| Ventral | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Internal Strangulation | 2 | 2 | .. | .. | .. | .. | 2 | 2 | .. | .. |
| Fæcal Fistula | 2 | 2 | 2 | 2 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **Diseases of Rectum and Anus.** | | | | | | | | | | |
| Stricture | 1 | 7 | .. | 6 | 1 | 1 | .. | .. | .. | .. |
| Imperforate Anus | 2 | 1 | 2 | 1 | .. | .. | .. | .. | .. | .. |
| Fistula in Ano | 37 | 6 | 33 | 6 | 2 | .. | .. | .. | 2 | .. |
| Hæmorrhoids | 6 | 6 | 6 | 6 | .. | .. | .. | .. | .. | .. |
| Fissure of Anus | 3 | 6 | 3 | 6 | .. | .. | .. | .. | .. | .. |
| Ulcer of Rectum | 3 | 4 | 3 | 3 | .. | .. | .. | .. | .. | 1 |
| Ischio-Rectal Abscess | 4 | 6 | 4 | 6 | .. | .. | .. | .. | .. | .. |
| Recto-Vaginal Fistula | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Prolapsus | 2 | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. |
| Polypus | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| **Diseases of Urinary System.** | | | | | | | | | | |
| Ectopia Vesicæ | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Cystitis— | | | | | | | | | | |
| Acute | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. |
| Chronic | 3 | 4 | 3 | 3 | .. | .. | .. | .. | .. | 1 |
| Calculus Vesicæ— | | | | | | | | | | |
| *a.* Phosphatic | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| *b.* Uric Acid | 5 | 1 | 5 | 1 | .. | .. | .. | .. | .. | .. |
| *c.* Oxalate of Lime | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Vascular Growth, Urethra | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Tubercular Disease of Urinary Tract | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Irritable Bladder | 3 | .. | 2 | .. | .. | .. | .. | .. | 1 | .. |
| Tumor in Bladder | 1 | 1 | .. | 1 | .. | .. | 1 | .. | .. | .. |
| Symptoms of Stone | 2 | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. |
| Polypoid Growth | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| Œdema of Scrotum | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| *Diseases of Prostate Gland.* | | | | | | | | | | |
| Enlarged Prostate | 10 | .. | 5 | .. | 3 | .. | .. | .. | 2 | .. |
| *Gonorrhœa and its Complications.* | | | | | | | | | | |
| Condylomata | .. | 14 | .. | 11 | .. | .. | .. | .. | .. | 3 |
| Gonorrhœa | 37 | 68 | 35 | 64 | 1 | .. | .. | .. | 1 | 4 |
| Bubo | 8 | 2 | 8 | 1 | .. | .. | .. | .. | .. | 1 |
| Perineal Abscess | 7 | .. | 5 | .. | .. | .. | .. | .. | 2 | .. |
| Orchitis | 7 | .. | 7 | .. | .. | .. | .. | .. | .. | .. |
| *Diseases of Urethra.* | | | | | | | | | | |
| Stricture— *a.* Organic, *b.* Traumatic, *c.* Congestive | 52 | .. | 45 | .. | 2 | .. | 2 | .. | 3 | .. |
| Urinary Fistula | 8 | .. | 7 | .. | .. | .. | .. | .. | 1 | .. |
| Extravasation of Urine | 5 | .. | 1 | .. | .. | .. | 3 | .. | 1 | .. |
| Retention of Urine | 13 | .. | 12 | .. | .. | .. | 1 | .. | .. | .. |
| Urethral Calculus | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **Diseases of Urinary System (*continued*).** | | | | | | | | | | |
| *Diseases of the Penis and Testis.* | | | | | | | | | | |
| Malformation— | | | | | | | | | | |
| Phimosis | 72 | .. | 64 | .. | 3 | .. | .. | .. | 5 | .. |
| Hypospadias | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Narrow Meatus | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Paraphimosis | 8 | .. | 8 | .. | .. | .. | .. | .. | .. | .. |
| Hæmatocele | 2 | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| Hydrocele | 19 | .. | 17 | .. | 2 | .. | .. | .. | .. | .. |
| Hydrocele of Cord | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Hernia Testis | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Orchitis | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| Sarcoma Testis | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Varicocele | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Epididymitis | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| **Diseases of Female Organs of Generation.** | | | | | | | | | | |
| Diseases of the Ovary | .. | 15 | .. | 9 | .. | 2 | .. | 2 | .. | 2 |
| *Diseases of the Vagina.* | | | | | | | | | | |
| Vesico-Vaginal Fistula | .. | 7 | .. | 6 | .. | .. | .. | 1 | .. | .. |
| Vaginitis | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| *Diseases of Vulva.* | | | | | | | | | | |
| Abscess of Labium | .. | 4 | .. | 4 | .. | .. | .. | .. | .. | .. |
| Cyst of Labium | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Hypertrophy of Nympha | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| *Affections connected with Parturition.* | | | | | | | | | | |
| Ruptured Perinæum | .. | 8 | .. | 8 | .. | .. | .. | .. | .. | .. |
| **Diseases of the Female Breast.** | | | | | | | | | | |
| Eczema of Nipple | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Abscess | .. | 15 | .. | 14 | .. | .. | .. | .. | .. | 1 |
| Ulcer | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Milk Abscess | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Inflamed Breast | .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. |
| Non-Malignant Tumours— | | | | | | | | | | |
| Cysts | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Mammary Glandular | .. | 13 | .. | 13 | .. | .. | .. | .. | .. | .. |
| Sarcoma | .. | 4 | .. | 3 | .. | .. | .. | 1 | .. | .. |
| Doubtful | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **Diseases of the Organs of Locomotion.** | | | | | | | | | | |
| *Diseases of Bones.* | | | | | | | | | | |
| Ostitis | 2 | 1 | 2 | .. | .. | .. | .. | .. | .. | 1 |
| Periostitis | 13 | 4 | 12 | 4 | .. | .. | .. | .. | 1 | .. |
| Diffuse Periostitis— | | | | | | | | | | |
| Acute Necrosis | 7 | 3 | 5 | 2 | .. | .. | 1 | .. | 1 | 1 |
| Caries | 8 | 15 | 5 | 10 | .. | 1 | 1 | 2 | 2 | 2 |
| Necrosis | 45 | 17 | 35 | 13 | 1 | 2 | 2 | .. | 7 | 2 |
| Tumours— | | | | | | | | | | |
| *a.* Enchondroma | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| *b.* Exostosis | 11 | 6 | 9 | 5 | .. | 1 | 1 | .. | 1 | .. |
| *c.* Sarcoma | 4 | .. | 3 | .. | 1 | .. | .. | .. | .. | .. |
| Old Amputations and Deformities | 42 | 4 | 33 | 4 | 4 | .. | .. | .. | 5 | .. |
| Deformities from Rickets, &c. | 7 | 7 | 7 | 4 | .. | 2 | .. | .. | .. | 1 |
| *Diseases of Joints.* | | | | | | | | | | |
| Rheumatic Synovitis | 3 | 3 | 3 | 2 | .. | 1 | .. | .. | .. | .. |
| Acute Synovitis | 11 | 6 | 11 | 6 | .. | .. | .. | .. | .. | .. |
| Chronic Synovitis | 19 | 20 | 18 | 17 | .. | 1 | .. | .. | 1 | 2 |
| ,, Disease | 131 | 64 | 101 | 45 | 4 | 1 | 8 | 1 | 18 | 17 |
| Ankylosis | 13 | 16 | 11 | 14 | .. | 1 | 1 | 1 | 1 | .. |
| Knock-Knee | 12 | 8 | 10 | 5 | 2 | 1 | .. | .. | .. | 2 |
| Disease of the Sacro-Iliac— | | | | | | | | | | |
| Synchondrosis | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Loose Cartilage in Knee | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| Bow Legs | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Loose Scapula | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| *Diseases of the Spine.* | | | | | | | | | | |
| Caries | 22 | 9 | 19 | 7 | .. | 1 | 3 | 1 | .. | .. |
| Psoas, Lumbar, and other Abscesses | 10 | 9 | 6 | 7 | 2 | .. | 2 | .. | .. | 2 |
| Lateral Curvature | 11 | 5 | 6 | 5 | 2 | .. | .. | .. | 3 | .. |
| Spina Bifida | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| *Diseases of Muscles, Tendons, &c.* | | | | | | | | | | |
| Congenital Deformity of Legs | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Flat Foot | 2 | 1 | 1 | .. | 1 | 1 | .. | .. | .. | .. |
| Contraction of Tendons, Fasciæ, or Muscles | 5 | 9 | 4 | 7 | 1 | 1 | .. | .. | .. | 1 |
| Club-Foot— | | | | | | | | | | |
| *a.* Talipes Equinus | 6 | 5 | 4 | 4 | 1 | .. | .. | .. | 1 | 1 |
| *b.* Do. Equino-varus | 9 | 11 | 6 | 9 | .. | 1 | 1 | .. | 2 | 1 |
| *c.* Do. Varus | 2 | 4 | 1 | 2 | .. | .. | .. | .. | 1 | 2 |
| *d.* Do. Valgus | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| **DISEASES OF THE ORGANS OF LOCOMOTION (*continued*).** | | | | | | | | | | |
| *Diseases of Muscles, Tendons, &c. (continued).* | | | | | | | | | | |
| Wry-neck | 3 | 2 | 1 | 2 | 2 | .. | .. | .. | .. | .. |
| Enlarged Bursa Patellæ | 1 | 14 | 1 | 13 | .. | .. | .. | .. | .. | 1 |
| Inflammation and Suppuration of Bursa Patellæ, etc. | 16 | 27 | 14 | 26 | .. | .. | .. | .. | 2 | 1 |
| Ganglion | 2 | 1 | 2 | 1 | .. | .. | .. | .. | .. | .. |
| Bursal Tumour | 2 | 1 | 2 | 1 | .. | .. | .. | .. | .. | .. |
| Admitted for New Instruments | .. | 5 | .. | 5 | .. | .. | .. | .. | .. | .. |
| Supernumerary Thumb | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| **DISEASES OF THE CELLULAR TISSUE.** | | | | | | | | | | |
| Hydatid Cyst | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Abscess | 97 | 77 | 90 | 72 | 1 | .. | 2 | 2 | 4 | 3 |
| Suppuration of Hand, Fingers, etc. | 18 | .. | 12 | .. | .. | .. | 1 | .. | 5 | .. |
| Connective Tissue Tumours— | | | | | | | | | | |
| *a.* Fatty | .. | 19 | .. | 16 | .. | 2 | .. | .. | .. | 1 |
| *b.* Sarcoma | 4 | 9 | 2 | 7 | 1 | .. | 1 | 1 | .. | 1 |
| *c.* Fibrous | 5 | 6 | 4 | 6 | 1 | .. | .. | .. | .. | .. |
| *d.* Myxoma | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| *e.* Enchondroma | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| *f.* Neuroma | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| *g.* Doubtful | 1 | 5 | .. | 2 | 1 | 2 | .. | .. | .. | 1 |
| Sebaceous Cysts | 16 | 4 | 16 | 3 | .. | .. | .. | .. | .. | 1 |
| Dermoid Cysts | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Simple Cysts | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Omental Tumour | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Painful Subcutaneous Tumour | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Congenital Cyst | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| **DISEASES OF THE CUTANEOUS SYSTEM.** | | | | | | | | | | |
| Œdema | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Ulcer | 47 | 35 | 37 | 34 | 1 | .. | .. | 1 | 9 | .. |
| Carbuncle | 8 | 1 | 6 | 1 | .. | .. | .. | .. | 2 | .. |
| Gangrene, Frost-bite, &c. | 11 | 2 | 7 | 1 | .. | .. | 2 | 1 | 2 | .. |
| Nævus | 1 | 19 | 1 | 16 | .. | 1 | .. | .. | .. | 2 |
| In-growing Toe-nail | 10 | 6 | 10 | 6 | .. | .. | .. | .. | .. | .. |
| Cicatrix | 2 | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. |
| Onychia | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Chilblain | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Warts | .. | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. |
| Bunion and Corns | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| GENERAL INJURIES. | | | | | | | | | | |
| Burns and Scalds | 45 | 36 | 33 | 20 | .. | .. | 8 | 12 | 4 | 4 |
| Contusions | 41 | 14 | 40 | 13 | .. | .. | .. | .. | 1 | 1 |
| LOCAL INJURIES. | | | | | | | | | | |
| *Injuries of the Head—* | | | | | | | | | | |
| Gunshot Wound | 3 | .. | 2 | .. | .. | .. | .. | .. | 1 | .. |
| Contusion | 10 | 2 | 10 | 1 | .. | .. | .. | .. | .. | 1 |
| Scalp Wound | 28 | 8 | 27 | 7 | .. | .. | .. | 1 | 1 | .. |
| Concussion of Brain | 47 | 11 | 38 | 10 | .. | .. | 5 | 1 | 4 | .. |
| Fracture of Vault of Skull— | | | | | | | | | | |
| Simple | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Compound | 5 | .. | 3 | .. | .. | .. | 2 | .. | .. | .. |
| Fracture Base of Skull | 7 | .. | 4 | .. | .. | .. | 3 | .. | .. | .. |
| *Of the Face.* | | | | | | | | | | |
| Contusion | 4 | 2 | 4 | 1 | .. | .. | .. | .. | .. | 1 |
| Wound | 4 | 4 | 4 | 4 | .. | .. | .. | .. | .. | .. |
| Fracture, Lower Jaw | 7 | 2 | 5 | 2 | .. | .. | .. | .. | 2 | .. |
| Fracture, Upper Jaw | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| *Injuries of the Eye.* | | | | | | | | | | |
| Foreign Body in Eye | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Wound of Eye | 9 | 4 | 8 | 4 | .. | .. | .. | .. | 1 | .. |
| Dislocated Lens | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Lime in Eye | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| *Injuries of the Neck.* | | | | | | | | | | |
| Wounds, &c. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| Sprains | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Scald of Throat | 7 | .. | 5 | .. | .. | .. | 2 | .. | .. | .. |
| Cut Throat | 5 | 2 | 3 | 2 | .. | .. | 2 | .. | .. | .. |
| Foreign Body in Œsophagus | 1 | 1 | .. | 1 | .. | .. | 1 | .. | .. | .. |
| *Injuries of the Chest.* | | | | | | | | | | |
| Fractured Sternum | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Contusions | 5 | .. | 4 | .. | .. | .. | 1 | .. | .. | .. |
| Fractured Ribs and Sternum | 12 | 6 | 12 | 6 | .. | .. | .. | .. | .. | .. |
| Do. Lung Wounded | 6 | .. | 3 | .. | .. | .. | 3 | .. | .. | .. |
| Wound | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | . |
| *Injuries of the Back.* | | | | | | | | | | |
| Contusion | 7 | .. | 7 | .. | .. | .. | .. | .. | .. | .. |
| Fracture of the Spine | 4 | .. | .. | .. | .. | .. | 4 | .. | .. | .. |
| Concussion | 3 | 2 | 3 | 2 | .. | .. | .. | .. | .. | .. |
| Wound | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Sprain | 5 | 2 | 5 | 2 | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| LOCAL INJURIES (*continued*). | | | | | | | | | | |
| *Injuries of the Abdomen.* | | | | | | | | | | |
| Contusion .. .. .. | 6 | .. | 6 | .. | .. | .. | .. | .. | .. | .. |
| Do. with Rupture of Viscera .. .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Wound .. .. .. | 3 | .. | 2 | .. | .. | .. | .. | .. | 1 | .. |
| *Injuries of the Pelvis.* | | | | | | | | | | |
| Wound of Scrotum .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| Wound of Vulva .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Ruptured Urethra.. .. | 5 | .. | 4 | .. | .. | .. | 1 | .. | .. | .. |
| Fracture of Pelvis .. .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| *Injuries of the Upper Extremity.* | | | | | | | | | | |
| Contusion .. .. .. | 5 | 1 | 4 | 1 | .. | .. | .. | .. | 1 | .. |
| Needle in Hand and Arm.. | .. | 4 | .. | 4 | .. | .. | .. | .. | .. | .. |
| Wound— | | | | | | | | | | |
| Wrist Joint .. .. | 6 | .. | 5 | .. | .. | .. | .. | .. | 1 | .. |
| Of Arm .. .. .. | 5 | 2 | 4 | 2 | .. | .. | 1 | .. | .. | .. |
| Of Forearm .. .. | 6 | 1 | 5 | 1 | .. | .. | .. | .. | 1 | .. |
| Of Hand .. .. .. | 33 | 3 | 30 | 3 | .. | .. | 1 | .. | 2 | .. |
| Of Elbow Joint .. .. | 3 | 1 | 3 | 1 | .. | .. | .. | .. | .. | .. |
| Olecranon .. .. .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Thumb .. .. .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| Fracture of— | | | | | | | | | | |
| Clavicle .. .. .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |
| Humerus— | | | | | | | | | | |
| Simple .. .. .. | 13 | 6 | 12 | 6 | .. | .. | .. | .. | 1 | .. |
| Compound .. .. .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Forearm— | | | | | | | | | | |
| Simple .. .. .. | 4 | 3 | 4 | 3 | .. | .. | .. | .. | .. | .. |
| Compound .. .. .. | 2 | 1 | 2 | .. | .. | .. | .. | 1 | .. | .. |
| Ununited .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Sprain .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Dislocation of— | | | | | | | | | | |
| Radius .. .. .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Clavicle .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Humerus .. .. .. | 7 | 2 | 5 | 2 | 1 | .. | 1 | .. | .. | .. |
| Forearm .. .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Phalanx .. .. .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. |
| Old Dislocations .. .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Thumb .. .. .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| *Injuries of Lower Extremity.* | | | | | | | | | | |
| Contusions .. .. .. | 15 | 2 | 12 | 2 | .. | .. | 2 | .. | 1 | .. |
| Sprained Ankle .. .. | 11 | 7 | 11 | 7 | .. | .. | .. | .. | .. | .. |
| Impacted Needles .. .. | 1 | 3 | 1 | 3 | .. | .. | .. | .. | .. | .. |
| Sprained Knee .. .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. | .. |

| DISEASES. | Total number of cases under treatment. | | Discharged cured and relieved. | | Unrelieved. | | Died. | | Remaining in at the end of the year 1879. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| LOCAL INJURIES (*continued*). | | | | | | | | | | |
| *Injuries of Lower Extremity (contd.)* | | | | | | | | | | |
| Wounds— | | | | | | | | | | |
| Of Thigh | 5 | 1 | 5 | 1 | .. | .. | .. | .. | .. | .. |
| Over Knee | 12 | 2 | 11 | 2 | .. | .. | .. | .. | 1 | .. |
| Of Leg | 12 | 4 | 10 | 4 | .. | .. | 2 | .. | .. | .. |
| Of Foot | 10 | 1 | 9 | 1 | .. | .. | .. | .. | 1 | .. |
| Of Knee Joint | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Buttock | 2 | 1 | 2 | 1 | .. | .. | .. | .. | .. | .. |
| Fracture of Femur— | | | | | | | | | | |
| Simple | 43 | 28 | 40 | 24 | .. | .. | 2 | 1 | 1 | 3 |
| Compound | 6 | 2 | 4 | 1 | .. | .. | 1 | 1 | 1 | .. |
| Green Stick | .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. |
| Fracture of Cervix Femoris— | | | | | | | | | | |
| Intracapsular | 5 | 9 | 5 | 8 | .. | .. | .. | 1 | .. | .. |
| Extracapsular | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. |
| Fracture of Patella | 22 | 11 | 17 | 10 | .. | .. | .. | .. | 5 | 1 |
| Fracture of both Bones of the Leg— | | | | | | | | | | |
| Simple | 76 | 23 | 67 | 20 | .. | .. | 1 | .. | 8 | 3 |
| Compound | 10 | 2 | 9 | 1 | .. | .. | .. | 1 | 1 | .. |
| Ununited | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. |
| Badly United | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. |
| Fracture of Tibia alone— | | | | | | | | | | |
| Tibia and Femur | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Simple | 25 | 12 | 22 | 9 | .. | .. | 1 | .. | 2 | 3 |
| Compound | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Potts Fracture | 16 | .. | 13 | .. | .. | .. | .. | .. | 3 | .. |
| Compound Fracture Leg and Arm | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Fracture of Fibula alone— | | | | | | | | | | |
| Simple | 24 | 10 | 21 | 10 | .. | .. | .. | .. | 3 | .. |
| Compound | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Fracture of Bones of Foot— | | | | | | | | | | |
| Simple | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Compound | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| Dislocations— | | | | | | | | | | |
| Great Toe | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. |
| Hip | 6 | .. | 3 | .. | .. | .. | .. | .. | 3 | .. |
| Shoulder | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Knee | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 |
| Ankle | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. |
| *Diseases and Injuries not classified.* | | | | | | | | | | |
| Nihil | 3 | 9 | 3 | 9 | .. | .. | .. | .. | .. | .. |
| Impacted Needle | .. | 3 | .. | 3 | .. | .. | .. | .. | .. | .. |

# ABSTRACT OF TABLE I,

*With Average Duration of Surgical Patients in the Hospital.*

| | | |
|---|---|---|
| Discharged Cured or Relieved .. .. .. .. .. | M. = 1900 | |
| | F. = 1251 | |
| Discharged Unrelieved .. .. .. .. .. .. | M. = 81 | |
| | F. = 68 | |
| Died .. .. .. .. .. .. .. .. .. .. | M. = 118 | |
| | F. = 56 | |
| Remaining in at the end of the year 1879 .. .. .. .. | M. = 171 | |
| | F. = 109 | |
| Average stay in the Hospital .. .. .. .. .. | M. = 33·19 days. | |
| | F. = 32·31 „ | |

Average stay in the Hospital of all Surgical Patients = 32·75 days.

# APPENDIX TO TABLE I.

## General Diseases.

*Growth in the Lower Lip.*—A labourer, aged 48, three months before admission, fell down when drunk, and cut his lower lip. A stitch was put in, the wound healed, and all swelling passed off. A few weeks after the accident he noticed a swelling at the injured part of the lip; it increased slowly in size, but his health remained good. When admitted the left lip was much enlarged by what appeared to be a sub-mucous growth. The swelling was principally confined to the mucous surface, about the shape of a small walnut, and seemed to be chiefly composed of large veins. The glands on both sides were hard and enlarged. The disease was supposed to be nævoid, or possibly a malignant growth. The patient left the hospital without operation.

*Enchondroma of the Tibia, in a man aged* 45.—The growth had been noticed for nine months. When admitted there was a large tumor growing from the left tibia at the inner and upper part of the bone. The skin over it moved freely, but was darkly marked by blue veins. The tumor was removed by Mr. Savory by means of a posterior incision. It was growing from the tibia just below the epiphysis, and was covered with a well-marked capsule. The patient made a good recovery, and could walk fairly when discharged. The tumor was composed of a dense fibrous capsule, from which fibrous bands extended into the tumor in all directions; between these softer cartilage was contained.

*Enchondroma.*—A patient, aged 28, had a cartilaginous tumour growing beneath the deep fascia of the arm just below the axilla. This had been growing seven years before removal, and was the size of a cricket-ball. On removal a large part of the tumor was found to consist of small, completely-detached, lobulated pieces of cartilage, which fell out on the floor when the capsule was divided. Besides the main mass, there were other detached portions of cartilage, extending far up into the axilla. The patient made a good recovery.

*Cancer of the Rectum.*—In a man of 50 Mr. Baker removed the last 3½ inches of the rectum. The patient died from peritonitis. This is the first recorded case of rectal excision performed at St. Bartholomew's Hospital.

## Diseases of the Circulatory System.

*Popliteal Aneurism.*—A man, aged 48, had noticed a swelling in the popliteal space for six months. Two months before admission he had been treated in another hospital by a Martin's bandage, which had been applied for 8 hours without benefit. Intermittent pressure and flexion were also tried, but proved a failure. On admission was treated with an elastic bandage without success, and then by compression of the vessel. After compression for 8 hours all pulsation ceased, and the tumor became firm; during the whole of the next day there was no pulsation, but during the night pulsation appeared in the tumor as violently as ever. The vessel was then tied in Scapa's triangle by Mr. T. Smith, with a silk ligature soaked in carbolic acid, both ends cut short, and the operation performed antiseptically; by the 18th day the wound was healed and the antiseptic left off; on the 28th day a small aneurismal swelling appeared beneath the middle of the scar. This swelling was poulticed for three days, when blood began to ooze from it, and the superjacent skin broke down. The oozing was pretty free, and the blood of a dark colour. The vessel was cut down upon in the site of the old wound, and was found with the

silk legature still round it. No bleeding orifice could be discerned. The vessel was then tied ½ an inch above and the same distance below the old seat of ligature. The operation was not antiseptic, and performed without difficulty. On the 3rd day symptoms of pyæmia occurred, from which disease the patient died 8 days later.

*Subclavian Aneurism.*—In December, 1878, whilst getting down from an omnibus the patient missed his footing, and his whole weight was momently thrown upon his left arm with which he seized the rail above his head. He felt some pain for a few days, which then passed off. In January, 1879, he began to feel numbness of the left forearm, this came on gradually, and was accompanied by loss of power in the hand and arm. Soon afterwards he noticed a swelling above the clavicle. On admission into the Hospital there was a tumor on the left side of the neck, about half the size of an orange. It carried forward the left sterno-mastoid muscle, but did not disturb the line of its border. It rose as high as the pomum adami. It was bounded below by the clavicle, and reached as far outward as the middle point of that bone. The tumor was soft, with a marked distensile impulse. A faint systolic murmur could be heard over the swelling. The pulse in left wrist very feeble. On July 16th Tufnell's diet treatment was commenced, this was continued for some time without any marked improvement. In October the tumor became larger, and the patient gradually died, dysnpœa being a troublesome complication. A *post-mortem* examination showed a large aneurism of the left subclavian artery. It had destroyed the posterior parts of the upper ribs, and had eroded the under surface of the scapula.

*Aneurism by Anastomosis.*—This was in the case of a girl aged 21. Since birth a small pulsating tumor had been noticed on the pinna of the ear. When a few years old it was partly removed by ligature, and what remained had increased to such an extent as to involve the whole of the ear, which was converted into a large pulsating erectile mass; the arteries and veins in the immediate neighbourhood being also greatly dilated. The entire growth was removed by Mr. T. Smith by a circular incision, the external carotid artery having been previously ligatured. The patient quickly recovered.

## Nervous System.

During the year there were several interesting cases of the bringing together by operation the separated ends of nerves in cases of old injury. Amongst these were the following:—

A patient, ten months before admission, fell from some steps whilst cleaning a window. His right elbow went through the glass, causing an incised wound at the back of the elbow. There was a scar visible, passing from the olecranon upwards and inwards across the internal condyle. At the point where the scar crossed the ulnar nerve a thickening could be felt, and pressure on this point caused a sensation of pain in the inner side of the hand. The muscles of the forearm on the ulnar side were smaller than those on the left arm. Sensation was greatly impaired over the ulnar side of the forearm, and quite lost over the ulnar part of the hand. The middle and index fingers were flexed, and extended with difficulty. The ring and little fingers could not be extended. There was a small ulceration at the point of the little finger. The scar was cut down upon by Mr. Savory, and the ulnar nerve exposed. The ends of the divided nerve were half-an-inch apart, the upper end being bulbous, the lower not. About a quarter of an inch was cut from each extremity of the nerve. The ends were then united by cat-gut ligatures. The wound healed well, and a month later the patient was discharged, with good sensation over ring and middle fingers, but sensation had not returned over the two last phalanges of the little finger. The movement of the ring and middle fingers was greatly improved, and not much changed in the little finger.

A man was cleaning a window some months before admission, and inflicted a severe cut just above the wrist, the cut extending obliquely from the lower end of the radius three or four inches upwards. The wound had healed. On admission into the hospital, the hand was cold, the skin being blue and shiny.

There was complete loss of sensation in all the parts supplied by the median nerve; the hand was almost useless for purposes of work. Mr. Holden cut down upon the median nerve with a longitudinal incision. It was found completely divided, the ends being half-an-inch apart and adherent to the surrounding tissue; they were separated, and the extreme ends cut off. The two portions were then joined together with fine sutures, and the hand flexed and fixed in an immovable apparatus. On the following day, sixteen hours after the operation, sensation was entirely restored in the hand, and a few days later it had quite lost its swollen, bluish appearance. The patient was discharged in a few weeks, the wound being healed and the sensation perfect.

A girl, aged 24, put her left elbow through a pane of glass, causing a transverse incised wound of the inner side of the elbow, dividing the triceps muscle and the ulnar nerve, complete loss of all sensation in the parts supplied by the nerve following. The ends of the ulnar nerve were fastened together with cat-gut sutures; its function was completely restored, with the exception of sensation in the little finger.

Diseases of the Urinary Organs:

*Ectopia Vesicæ.*—A boy, aged 7, had the mucous membrane of the posterior portion of the bladder exposed over a surface the size of half-a-crown. The orifices of both ureters were clearly visible, and the urine could be seen passing from them drop by drop, the orifices closing up after each drop was expelled. The penis was very small, the upper wall being deficient. With the exception of this deformity the boy was healthy. The patient being under chloroform. Mr. Tom Smith passed a small gum elastic catheter into the orifice of the left ureter, and along its canal as far as possible. An incision was then made in the left lumbar region 4 inches long, in the position of a colotomy wound. The peritoneum, colon, and kidney were exposed, and after some difficulty the ureter was found deeply seated 2 inches from the surface. It was raised upon an aneurism needle, and cut through as low down as possible. A very small opening was made in the back of the descending colon, into which the cut end of the ureter was placed, and there fixed by a couple of fine cat-gut sutures. The external wound was covered by sponges, soaked in carbolic lotion. During the next two months nearly all the motions passed through the wound. A month or two later, however, the wound closed, with the exception of a fistulous opening, the motions passing the right way. No urine flowed through the left ureter, and the exposed mucous membrane on the right side had undergone a marked change, and had assumed nearly all the characters of ordinary skin. Fourteen months after the first operation the ureter of the opposite side was turned into the corresponding colon. The following day the patient was very collapsed, had frequent vomiting, and died forty-eight hours after the operation. At the post-mortem examination there were no signs of peritonitis. The left kidney could not be found, and appeared to be completely atrophied, its place being represented by some dense fibrous tissue. The right kidney was greatly enlarged, and its pelvis distended by a collection of urine, which apparently could not pass into the colon on account of some obstacle at the cut end of the ureter.

Bigelow's Operation of Litholapaxy was performed in a man of 60 by Mr. Smith, and the patient cured by two washings.

Diseases of the Intestines:

The patient, a drinker, aged 45, had for some years noticed a small tumour in the groin, which, however, had never given him trouble. Two days before admission he felt great pain in the centre of the abdomen. This was soon followed by vomiting, which continued almost without intermission till he came to the Hospital. When admitted he had hiccup, and was much collapsed. Mr. Marsh cut down upon the swelling but found no hernia. The finger introduced into the abdominal cavity through the internal ring detected a strangulation of the gut. The inguinal wound was then closed, and the abdominal cavity opened by an incision in the linea alba.

A portion of the small intestine was found tightly strangulated by a fibrous band. This was divided and the gut drawn out. The wound was closed with sutures.

During the next few days the patient had several free actions of the bowels. On the 5th day symptoms of septicæmia set in, from which he died at the end of the week.

Another patient in which abdominal section was performed, had an attack of vomiting and constipation, six months before admission. This had passed off in a few days. Five days before admission, after a heavy meal of sausages, he went to bed well, but was soon disturbed by a violent vomiting and pain in the abdomen. Vomiting continued until his admission into the Hospital. Aperients and enemata were administered without beneficial effect. Abdominal section was performed by an incision in the middle line The intestines were acutely inflamed. Near the cœcum a band of fibrous tissue was found constricting the gut. The constriction was divided, but the bowel burst at the strangulated portion. The patient died in great pain seven hours later.

Injuries of the Head:

*Compound Fracture of Skull.*—This occurred in a young man, a bricklayer. While at work a brick fell from a height of 60 feet on to the top of his head. On admission he was conscious and tolerably rational, and suffering from shock. There was a considerable scalp wound and a large surface of bone exposed. There was a depressed fracture of the skull, just to the right of the sagittal suture. He had no symptoms of paralysis. On the integuments being drawn aside it was seen that the fracture was starred and deeply depressed in the centre. The free loose fragments of bone were removed by Mr. Holden, and the depressed portion sawn through and raised. The dura mater appeared uninjured. The patient did well for three months, when a triangular portion of bone involving the whole thickness of the skull came away. The wound quickly healed, and the patient was discharged from the Hospital well.

# TABLE II.

*Showing the comparative Frequency and Mortality of each Disease at different Ages.*

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| GENERAL DISEASES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Equinia .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Tetanus .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. |
| Phagedæna .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | 1 |
| Erysipelas— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *a.* Simple .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 4 | 2 | .. | .. | 3 | .. | .. | .. | 1 | 3 | .. | .. | 3 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 15 | 6 | .. | 1 |
| *b.* Phlegmonous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *c.* Diffuse Inflammation.. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 6 | .. | 1 | .. | 4 | 2 | .. | .. | 4 | .. | .. | .. | 2 | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 19 | 4 | 3 | .. |
| Pyæmia .. .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | 3 | 2 |
| Syphilis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Primary .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 40 | 23 | .. | .. | 15 | 15 | .. | .. | 3 | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 58 | 40 | .. | .. |
| B. Hereditary .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. |
| C. Local Syphilitic Affections— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Palate and Pharynx .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Larynx.. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Rectum .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |

TABLE II (*continued*).

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| GENERAL DISEASES (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Syphilis (*continued*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Local Syphilitic Affections (*continued*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Penis .. .. | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Testis .. .. | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Bone .. .. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | .. | 1 | | | | |
| Skin .. .. | | | | | | | | | | | | | 11 | 26 | | | 16 | 5 | | | 4 | | | | 2 | | | | | | | | | | | | | | 33 | 31 | | | | |
| Tertiary Syphilis | | | | | | | | | | | | | 6 | 11 | | | 7 | 7 | | | 3 | 3 | | | 3 | 1 | 2 | | | | | | | | | | | | 19 | 22 | 2 | | | |
| Cancer— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A. Scirrhus— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rectum .. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Female Breast | | | | | | | | | | | | | | | | | | 4 | | | | 1 | 1 | | 1 | 1 | | | 2 | | | | | 1 | | | | | 3 | 2 | 1 | | | |
| Glands .. | | | | | | | | | | | | | | | | | | | | | | 18 | | 2 | | 16 | | | | 7 | | | | 1 | | | | | .. | 46 | | 2 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | .. | 1 | | | | |
| B. Medullary— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Testis .. | 1 | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | |
| Bladder .. | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | 1 | | | | 1 | | 1 | | | |
| Glands .. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | 1 | | | | | | | | 1 | | 1 | | | |
| Upper Jaw .. | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 | | | | | .. | 2 | | | | |
| Foot .. .. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | .. | .. | | 1 | | |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| General Diseases (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cancer (*continued*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c. Epithelial— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Scars .. .. | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | 2 | | | |
| Ear .. .. | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | .. | 1 | | |
| Lip .. .. | | | | | | | | | | | | | | | | | 1 | | | | 2 | | | | 3 | | | | 4 | | | | 3 | | | | | | | | 13 | | | |
| Tongue .. | | | | | | | | | | | | | | | | | | | | | . | 1 | | | 8 | 1 | | | 9 | | 1 | | | | | | | | | | 17 | 2 | 1 | |
| Jaw and Mouth | | | | | | | | | | | | | | | | | | | | | 3 | | | | 2 | | | | 1 | | | | | | | | | | | | 6 | | | |
| Intestine .. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 |
| Rectum .. | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 1 | | |
| Scrotum .. | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | 3 | | | |
| Vulva .. | | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 | | 1 | | | | | | 1 | | | | | | | | 4 | | 1 |
| Chest .. | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | 1 | | | | | | | | 2 | | | |
| Penis .. | | | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | 1 | | | | | | | | 3 | | | |
| Nose .. .. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | 1 | | | |
| Eyelid .. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 | | | | 2 | | | |
| Lupus .. | | | | | 1 | | | | 2 | | | | 2 | | | | 2 | | | | | | | | | | | | | | | | | | | | 1 | | | | | 7 | | |
| Rodent Ulcer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 | | | 1 | | | | | | | | 5 | 1 | | |
| Scrofula— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Testicle .. | 1 | | | | | | | | | | | | 1 | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | 5 | | | |
| Bone .. | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| GENERAL DISEASES (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Scrofula (*continued*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Skin .. .. | .. | .. | .. | .. | 2 | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 2 | .. | .. |
| Tongue .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Hysteria .. .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 3 | .. | .. | .. | 2 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 5 | .. | .. |
| DISEASES OF THE EYE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Conjunctiva .. | 4 | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 3 | 2 | .. | .. | 2 | .. | .. | .. | 3 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 13 | 5 | .. | .. |
| Cornea .. .. | 6 | 5 | .. | .. | 7 | 5 | .. | .. | 3 | 3 | .. | .. | 12 | 14 | .. | .. | .. | 6 | .. | .. | 2 | 3 | .. | .. | 3 | 4 | .. | .. | 3 | 2 | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 38 | 42 | .. | .. |
| Iris .. .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 7 | 6 | .. | .. | 3 | 7 | .. | .. | 7 | 5 | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 20 | 20 | .. | .. |
| Crystalline Lens .. | 2 | .. | .. | .. | 4 | .. | .. | .. | 3 | 3 | .. | .. | 8 | .. | .. | .. | 3 | .. | .. | .. | 3 | 2 | .. | .. | 7 | .. | .. | .. | 4 | 5 | .. | .. | 7 | 2 | .. | .. | .. | .. | .. | .. | 41 | 12 | .. | .. |
| General Affections of the Eye .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 1 | 5 | .. | .. | 2 | 5 | .. | .. | 2 | 1 | .. | .. | .. | 2 | .. | .. | 4 | 3 | .. | .. | 4 | 4 | .. | 1 | .. | 3 | .. | .. | .. | 2 | .. | .. | 14 | 26 | .. | 1 |
| Strabismus .. | 3 | 2 | .. | .. | 6 | 6 | .. | .. | 8 | 10 | .. | .. | 6 | 2 | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 25 | 21 | .. | .. |
| Lachrymal Apparatus .. .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 5 | .. | .. |
| Eyelids .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | 4 | .. | .. | 2 | 3 | .. | .. | .. | 4 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 7 | 12 | .. | .. |
| Retina and Optic Nerve .. .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | .. | .. |
| Choroid .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. |
| Diseases of Orbit. . | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Ditto Vitreous .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Hypermetropia, &c. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 3 | .. | .. | 3 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | 6 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| **Diseases of the Ear.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Otitis Interna .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Otorrhœa .. .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | 1 |
| **Diseases of the Nose.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cartilaginous growth of Nose . | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Epistaxis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | 1 | 1 | .. | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | 4 | .. | .. |
| Polypus .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Ozœna .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| Lipoma .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Ulceration of Nose. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| **Diseases of the Circulatory System.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phlebitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | 2 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 4 | .. | 2 |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE CIRCULATORY SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Aneurism*— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| By Anastomosis | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| Popliteal | | | | | | | | | | | | | | | | | 1 | | | | 2 | | | | 1 | | 1 | | | | | | | | | | 4 | | 1 | | | | | |
| Subclavian | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Blood Tumor | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Varicose Veins | | | | | | | | | | | | | 1 | | | | 1 | | | | 1 | | | | | 1 | | | 1 | 1 | | | | | | 3 | 3 | | | | | | |
| Chilblain | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| Hæmorrhagic Diathesis | | | | | | | | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | | | | | | | 1 | | | | | | 1 |
| Lymphangitis, etc. | | | | | | | | | 1 | | | | 2 | 1 | | | 1 | 1 | | | | 1 | | | | | | 1 | | | | | | | | | 4 | 4 | | | | | | |
| DISEASES OF THE LIPS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Harelip | | 3 | 4 | | | 2 | 1 | | | 1 | | | | | | | | | | | 1 | | | | | | | | | | | | | | | 7 | 5 | | | | | | |
| Carbuncle | | | | | | | | | | 1 | | | | | | | 1 | | | | | | | | | | 1 | | | | | | | | | | 2 | | 1 | | | | | |
| Nævus | | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| Ulcer | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | | | | | | | | | | | | 2 | | | | | | |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | F | M | M | F | M | F | M | F | M | F | 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 Mouth and Cheek.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Deformity .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Abscess .. .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. |
| Cancrum Oris .. .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. |
| Stomatitis .. .. | .. | .. | .. | 1 | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 3 | .. | 1 |
| Ulcer .. .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 |
| **Diseases of Gums and Jaws.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phosphorus Necrosis, &c. .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 4 | .. | .. |
| Epulis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. |
| Tumours .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | .. |
| Ankylosis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Dental Abscess .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. |
| **Diseases of Palate and Fauces.** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Enlarged Thyroid .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. |
| Enlarged Tonsils .. | .. | 2 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 7 | .. | .. |
| Perforation Palate | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF PALATE AND FAUCES (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tonsillitis .. .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 6 | 10 | .. | .. | 1 | 9 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 23 | .. | .. |
| Cleft Palate .. | 2 | 4 | .. | .. | 2 | 2 | .. | .. | 2 | 2 | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 10 | 8 | .. | .. |
| Abscess and Necrosis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| DISEASES OF SALIVARY GLANDS. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calculus .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Parotid Glandular Tumour .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 1 | .. | .. |
| Adeno fibroma .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| DISEASES OF THE INTESTINES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hernia— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Umbilical .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. |
| Inguinal .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | 4 | .. | .. | .. | 5 | 1 | 1 | .. | 3 | .. | .. | .. | 3 | .. | 1 | .. | 1 | .. | .. | .. | 3 | .. | .. | .. | 1 | .. | 1 | .. | 22 | 1 | 4 | .. |
| Femoral .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | 2 | 1 | .. | 2 | 6 | 1 | .. | 2 | 7 | .. | 1 | .. | 2 | .. | 2 | .. | 4 | 1 | 1 | .. | 1 | .. | .. | 5 | 23 | 3 | 4 |
| Ventral.. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Fæcal Fistula .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| Diseases of the Intestines (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hernia (*contd.*)—Internal Strangulation .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 2 |
| Diseases of Rectum and Anus. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fistula in Ano .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 4 | 1 | .. | .. | 12 | 3 | .. | .. | 7 | 2 | .. | .. | 7 | .. | .. | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 35 | 6 | .. | .. |
| Hæmorrhoids .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | 2 | .. | .. | 3 | 3 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | 6 | .. | .. |
| Fissure of Anus .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | 1 | 4 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 6 | .. | .. |
| Ischio-Rectal Abscess .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 2 | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 6 | .. | .. |
| Ulcer of Rectum .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 3 | .. | .. |
| Recto-Vaginal Fistula .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Imperforate Rectum .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. |
| Stricture .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | 1 | 3 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 7 | .. | .. |
| Prolapsus .. .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. |
| Polypus .. .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF URINARY SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ectopia Vesicæ .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Cystitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | 1 | 1 | .. | .. | .. | .. | .. | 3 | 3 | .. | 1 |
| Calculus Vesicæ— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *a.* Uric Acid .. | .. | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 1 | .. | .. |
| *b.* Oxalate of Lime | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| *c.* Phosphatic .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. |
| Urethral Calculus . | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Irritable Bladder.. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 4 | 1 | .. | .. |
| Tubercular Disease of Urinary Mucous Membrane, &c. .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| Tumour of Bladder | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | 1 | .. |
| Vascular Growth.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Polypus .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| *Diseases of Prostate Gland.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Enlarged Prostate . | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 8 | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF URINARY SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Gonorrhœa and its Complications.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Condylomata .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 9 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 11 | .. | .. |
| Gonorrhœa .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 26 | 55 | .. | .. | 10 | 9 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 36 | 64 | .. | .. |
| Bubo .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 1 | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 1 | .. | .. |
| Perineal Abscess .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | .. | .. |
| Orchitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | .. | .. | .. |
| *Diseases of Urethra.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stricture— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *a.* Organic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *b.* Inflammatory | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 8 | .. | .. | .. | 8 | .. | 1 | .. | 19 | .. | .. | .. | 7 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 47 | .. | 2 | .. |
| *c.* Traumatic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Fistula .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF URINARY SYSTEM (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Diseases of Urethra (continued).* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Extravasation of Urine .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 3 | .. |
| Retention of Urine .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 4 | .. | .. | .. | 3 | .. | .. | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | 12 | .. | 1 | .. |
| *Diseases of Penis and Testis.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Malformations— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hypospadias, &c... | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Phimosis .. | 22 | .. | .. | .. | 5 | .. | .. | .. | 10 | .. | .. | .. | 20 | .. | .. | .. | 8 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 67 | .. | .. | .. |
| Paraphimosis,&c. | 1 | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 9 | .. | .. | .. |
| Hernia Testis .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Hæmatocele .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Hydrocele .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 8 | 1 | .. | .. | 5 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 20 | 1 | .. | .. |
| Varicocele .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Epididymitis .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Orchitis .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. |
| Tumors.. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| Diseases of Female Organs of Generation. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Diseases of the Ovary .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 5 | .. | 1 | .. | 1 | .. | 1 | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 11 | .. | 2 |
| *Diseases of Vagina.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Vesico-Vaginal Fistula .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 3 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | 1 |
| Vaginitis .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| *Diseases of Vulva, &c.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Abscess of Labium | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. |
| Ruptured Perinæum .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 6 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | .. | .. |
| Cyst Labium .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Hypertrophy of Nymphæ .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Diseases of the Female Breast. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Abscess .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | .. | .. | .. | 2 | .. | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 14 | .. | .. |
| Inflammation, etc. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE FEMALE BREAST (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Non-Malignant Tumours— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cysts .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Mammary Glandular .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. | .. | 7 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 13 | .. | .. |
| Sarcoma .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 1 |
| Doubtful .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| DISEASES OF THE ORGANS OF LOCOMOTION. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ostitis .. .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Periostitis .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 5 | 2 | .. | .. | 2 | 1 | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 12 | 4 | .. | .. |
| Diffuse Periostitis— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acute Necrosis | 1 | .. | .. | .. | .. | 1 | .. | .. | 3 | 1 | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 2 | 1 | .. |
| Caries .. | .. | 1 | .. | .. | 2 | 3 | .. | .. | .. | .. | 1 | .. | 2 | 3 | .. | .. | 1 | 3 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 11 | 1 | 2 |
| Necrosis .. | 2 | .. | .. | .. | 4 | 3 | .. | .. | 5 | 3 | .. | .. | 10 | 6 | 1 | .. | 6 | 1 | 1 | .. | 2 | .. | .. | .. | 4 | .. | .. | .. | 2 | 2 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 36 | 15 | 2 | .. |
| Tumours— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *a*. Exostosis .. | .. | 1 | .. | .. | 2 | .. | .. | .. | .. | 2 | .. | .. | 5 | 3 | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 9 | 6 | 1 | .. |
| *b*. Sarcoma .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. | .. |
| *c*. Enchondroma | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| Diseases of the Organs of Locomotion (*contd.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Old Amputations and Deformities | 1 | 1 | .. | .. | 5 | 1 | .. | .. | 5 | .. | .. | .. | 9 | .. | .. | .. | 8 | 1 | .. | .. | 5 | .. | .. | .. | 2 | .. | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 37 | 4 | .. | .. |
| Ricketts .. .. | 5 | 4 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | 6 | .. | .. |
| *Diseases of Joints.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rheumatic Synovitis .. .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 3 | .. | .. |
| Acute Synovitis .. | 2 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 4 | 4 | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 11 | 6 | .. | .. |
| Chronic do. .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 2 | 1 | .. | .. | 4 | 4 | .. | .. | 2 | 3 | .. | .. | 7 | 7 | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 18 | 18 | .. | .. |
| Chronic Disease .. | 6 | 9 | .. | .. | 23 | 11 | 1 | 1 | 21 | 9 | 2 | .. | 28 | 9 | 2 | .. | 17 | 6 | 2 | .. | 4 | 1 | .. | .. | 5 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 105 | 46 | 8 | 1 |
| Ankylosis .. .. | .. | .. | .. | .. | 2 | 1 | .. | .. | .. | 4 | .. | .. | 1 | 5 | 1 | .. | 4 | 1 | .. | .. | 2 | .. | .. | 1 | 1 | 1 | .. | .. | .. | 2 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 11 | 15 | 1 | 1 |
| Knock-Knee, &c. .. | 2 | 2 | .. | .. | 2 | 1 | .. | .. | 3 | 2 | .. | .. | 3 | 1 | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 12 | 6 | .. | .. |
| Disease of Sacro-iliac Synchondrosis .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Loose Scapula .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Bow Legs .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| *Diseases of the Spine.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Caries .. .. | 1 | 2 | .. | .. | 8 | 1 | 1 | .. | 2 | 1 | .. | .. | 3 | 1 | 2 | 1 | 4 | 1 | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 19 | 8 | 3 | 1 |
| Psoas, Lumbar, and other Abscesses . | .. | .. | .. | .. | 2 | 1 | .. | .. | 2 | 1 | .. | .. | 3 | 3 | 1 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 7 | 2 | .. |

H

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE ORGANS OF LOCOMOTION (*contd.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Diseases of the Spine (contd.).* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lateral Curvature | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. | 3 | 2 | .. | .. | 2 | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 5 | .. | .. |
| Spina Bifida, &c. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| *Diseases of Muscles, Tendons, &c.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Deformity of Legs | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Contraction of Tendons, Fasciæ, or Muscles | 1 | .. | .. | .. | 2 | .. | .. | .. | 1 | 1 | .. | .. | .. | 5 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 8 | .. | .. |
| Flat Foot | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. |
| Club Foot— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *a.* Talipes Equinus | .. | 1 | .. | .. | 1 | 3 | .. | .. | 4 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | 4 | .. | .. |
| *b.* Do. Equino-Varus | 3 | 4 | 1 | .. | 3 | 4 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | 10 | 1 | .. |
| *c.* Do. Varus, etc. | 1 | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 3 | .. | .. |
| Wry Neck | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | .. | .. |
| Supernumerary Thumb | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE ORGANS OF LOCOMOTION (*contd.*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Diseases of Muscles, Tendons, &c.* (*contd.*) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Enlarged Bursa Patellæ | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. | .. | 7 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 13 | .. | .. |
| Inflammation and Suppuration of Bursa Patellæ | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 3 | .. | .. | 1 | 13 | .. | .. | 5 | 3 | .. | .. | 2 | 3 | .. | .. | 2 | 4 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 14 | 26 | .. | .. |
| Ganglion | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. |
| Bursal Tumour | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. |
| Loose Cartilage | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Admitted for new Instruments | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | .. |
| DISEASES OF THE CELLULAR TISSUE. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Abscess, etc. | 7 | 14 | .. | 1 | 6 | 6 | .. | .. | 16 | 7 | .. | .. | 23 | 14 | .. | .. | 12 | 6 | 1 | .. | 12 | 15 | .. | .. | 6 | 7 | .. | .. | 9 | 1 | 2 | .. | .. | 1 | .. | 1 | .. | 1 | .. | .. | 91 | 72 | 3 | 2 |
| Suppurating Hydatid | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Connective Tissue Tumours— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Doubtful | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 4 | .. | .. |
| Enchondroma | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55 | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| DISEASES OF THE CELLULAR TISSUE (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tumours (*contd.*)— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *a.* Fatty .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. | .. | 8 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 18 | .. | .. |
| *b.* Sarcoma .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 2 | .. | .. | 2 | 1 | 1 | .. | 1 | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 7 | 1 | 1 |
| *c.* Fibrous .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | 1 | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 5 | 6 | .. | .. |
| *d.* Neuroma .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Sebaceous Cysts .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 4 | .. | .. | .. | 4 | 2 | .. | .. | 2 | 1 | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 16 | 3 | .. | .. |
| Dermoid Cysts .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Simple Cysts .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Omental Tumour .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Congenital Cyst .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| DISEASES OF THE CUTANEOUS SYSTEM. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ulcer .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | 8 | 7 | .. | .. | 8 | 9 | .. | .. | 10 | 4 | .. | .. | 9 | 3 | .. | 1 | .. | 7 | .. | .. | 3 | 1 | .. | .. | .. | .. | .. | .. | 38 | 34 | .. | 1 |
| Carbuncle .. .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | 1 | .. | .. |
| Gangrene .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | 3 | 1 | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | 7 | 1 | 2 | 1 |
| Cicatrix .. .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. |
| Nævus .. .. | 1 | 14 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 17 | .. | .. |
| In-growing Toe-Nail | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | 5 | .. | .. | 1 | 1 | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 10 | 6 | .. | .. |
| Onychia .. .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. |
| Frost-bite and Chilblain .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Bunion .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| GENERAL INJURIES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Burns and Scalds.. | 10 | 11 | 4 | 6 | 5 | 5 | 3 | 1 | 2 | 2 | .. | .. | 5 | .. | 1 | .. | 7 | 1 | .. | .. | 2 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | 1 | 1 | 1 | .. | .. | .. | .. | 3 | 33 | 20 | 8 | 12 |
| Contusions .. | 2 | 2 | .. | .. | 2 | .. | .. | .. | 3 | 1 | .. | .. | 14 | 2 | .. | .. | 7 | 3 | .. | .. | 5 | 2 | .. | .. | 6 | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 40 | 13 | .. | .. |
| LOCAL INJURIES. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Injuries of the Head.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gun-shot Wounds | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Contusions .. | .. | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 4 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 10 | 1 | .. | .. |
| Scalp Wounds .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 8 | .. | .. | .. | 4 | 3 | .. | .. | 11 | 1 | .. | .. | 2 | 1 | .. | .. | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 27 | 7 | .. | 1 |
| Concussion of Brain | .. | 3 | .. | .. | 4 | 2 | 1 | .. | 6 | 4 | .. | .. | 9 | .. | .. | .. | 6 | .. | 1 | .. | 7 | .. | 1 | .. | 2 | 1 | 1 | .. | 2 | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 38 | 10 | 5 | 1 |
| Fractures of Skull. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | 3 | .. | 1 | .. | 2 | .. | 1 | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 7 | .. | 6 | .. |
| *Injuries of the Face.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 1 | .. | .. |
| Wounds .. .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 4 | .. | .. |
| Fractures, &c. .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | 2 | .. | .. |
| *Injuries of the Eye* | .. | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | 7 | 3 | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 13 | 5 | .. | .. |
| *Injuries of the Neck.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Scald Throat .. | 4 | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | 2 | .. |
| Cut Throat .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 3 | 2 | 2 | .. |
| Other Injuries .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 2 | 1 | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45 | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| LOCAL INJURIES (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Injuries of the Chest.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 4 | .. | 1 | .. |
| Fractured Ribs .. | .. | .. | 1 | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 4 | 3 | 1 | .. | .. | .. | .. | .. | 5 | 2 | .. | .. | .. | 1 | 1 | .. | 4 | .. | .. | .. | .. | .. | .. | 15 | 6 | 3 | .. |
| Fractured Sternum | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| *Injuries of the Back.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions and Sprains .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 2 | 1 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 4 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 4 | .. | .. |
| Fracture of Spine . | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 4 | .. |
| Other Injuries .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 3 | 1 | .. | .. | 1 | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 1 | .. | .. |
| *Injuries of the Abdomen.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. | .. |
| Do., with Rupture of Viscera .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Wounds .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| *Injuries of the Pelvis.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wounds .. .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| LOCAL INJURIES (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Injuries of the Pelvis (continued).* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fractures .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. |
| Ruptured Urethra, &c. .. .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 1 | .. |
| *Injuries of the Upper Extremity.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Impacted Needles | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. |
| Contusions .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 1 | .. | .. |
| Wound— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Of Elbow Joint | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | 2 | .. | .. |
| „ Arm .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 4 | 2 | 1 | .. |
| „ Forearm and Wrist .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | .. | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 10 | 1 | .. | .. |
| „ Hand .. | 2 | .. | .. | .. | .. | 1 | .. | .. | 3 | .. | .. | .. | 12 | 1 | .. | .. | 6 | 1 | .. | .. | 5 | 1 | .. | .. | 4 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | 33 | 3 | 1 | .. |
| Fracture— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Of Clavicle .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. |
| „ Humerus .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 4 | 1 | .. | .. | 5 | .. | .. | .. | .. | 1 | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | 13 | 6 | .. | .. |
| „ Forearm and Hand .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | .. | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 6 | 4 | .. | 1 |
| Dislocations &c. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 1 | 2 | .. | .. | 2 | 2 | 1 | .. | 2 | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 6 | 7 | 1 | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | TOTAL. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | | M | F | M | F | M | F | M | F | M | F | M | F | M | F | M | F |
| LOCAL INJURIES (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Injuries of Lower Extremities.* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Contusions .. | .. | .. | .. | .. | 1 | .. | .. | .. | 3 | .. | .. | .. | 4 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | 2 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 12 | 2 | 2 | .. |
| Sprained Ankle .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 4 | 1 | .. | .. | 1 | 3 | .. | .. | 2 | 1 | .. | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 11 | 7 | .. | .. |
| Wounds— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Buttock and Thigh | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | 2 | .. | .. |
| Over Knee .. | .. | .. | .. | .. | 1 | .. | .. | .. | 3 | .. | .. | .. | 1 | 1 | .. | .. | 3 | 1 | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 11 | 2 | .. | .. |
| Of Leg .. .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 5 | .. | .. | .. | 3 | .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 10 | 4 | 2 | .. |
| Of Foot .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 4 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 9 | 1 | .. | .. |
| Of Knee-Joint .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. |
| Impacted Needles | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 3 | .. | .. |
| Fracture of Femur | 7 | 12 | .. | .. | 7 | 6 | .. | .. | 8 | 1 | 1 | 1 | 7 | 2 | .. | .. | 4 | 1 | .. | .. | 3 | 3 | .. | .. | 4 | .. | .. | .. | 3 | .. | .. | .. | .. | 2 | 2 | 1 | 1 | 1 | .. | .. | 44 | 28 | 3 | 2 |
| Cervix Femoris .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | 3 | 1 | .. | .. | 3 | 5 | .. | 1 | .. | 1 | .. | .. | 6 | 9 | .. | 1 |
| Patella .. .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 3 | 1 | .. | .. | 6 | 4 | .. | .. | 3 | 2 | .. | .. | 3 | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 17 | 10 | .. | .. |
| Fracture of both Bones of the Leg— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Simple .. .. | .. | 1 | .. | .. | 4 | 1 | .. | .. | 3 | .. | .. | .. | 12 | .. | 1 | .. | 15 | 1 | .. | .. | 10 | 7 | .. | .. | 15 | 5 | .. | .. | 8 | 2 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | 67 | 20 | 1 | .. |
| Compound .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 3 | 1 | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 9 | 1 | .. | 1 |
| Fracture of Tibia— | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Simple .. .. | 1 | 4 | .. | .. | 3 | 1 | .. | .. | 2 | 2 | .. | .. | 5 | .. | .. | .. | 1 | .. | .. | .. | 4 | 2 | 1 | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | 22 | 9 | 1 | .. |
| Potts Fracture.. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. | .. | 4 | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 13 | .. | .. | .. |

| DISEASES. | Under 5. | | | | 5–10. | | | | 10–15. | | | | 15–25. | | | | 25–35. | | | | 35–45. | | | | 45–55. | | | | 55–65. | | | | 65–75. | | | | 75 and upwards. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Discharged. | | Died. | | Discharged. | | Died. | | 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 | M | F | M | F |
| Local Injuries (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Injuries of Lower Extremities* (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fracture of Tibia and Femur .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | | | | |
| Compound Fracture of Leg and Arm .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | | | | |
| Fracture of Fibula— Simple .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | 1 | .. | .. | 7 | 1 | .. | .. | 6 | 2 | .. | .. | 4 | 2 | .. | .. | .. | 2 | .. | .. | .. | 2 | .. | .. | 21 | 10 | .. | .. | | | | |
| Compound .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | | | | |
| Fracture of Bones of Foot .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. | .. | | | | |
| Dislocations .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. | .. | | | | |
| Nihil .. .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 1 | .. | .. | 2 | 3 | .. | .. | .. | 3 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 3 | 9 | .. | .. | | | | |

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 5 Years. | | 5— | | 10— | | 20— | | 30— | | 40— | | 50— | | 60— | | 70— | | Total. | | Cured and Relieved. | | Not Relieved. | | 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 |
| **Operations on the Eye.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Strabismus | 3 | 2 | 4 | 11 | 10 | 3 | 2 | 2 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | 20 | 19 | 20 | 17 | .. | 2 | .. | .. |
| Iridectomy | 1 | .. | .. | 1 | 2 | 3 | 6 | 4 | 6 | 2 | 4 | 5 | 3 | 6 | 2 | 3 | 1 | 1 | 25 | 25 | 23 | 23 | 2 | 1 | .. | 1 |
| Cataract— | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Linear Extraction | .. | .. | 1 | .. | 2 | 1 | 2 | 1 | .. | .. | 3 | 1 | 2 | 1 | 5 | 1 | 2 | 1 | 17 | 6 | 6 | 5 | .. | 1 | .. | .. |
| Flap Extraction | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 3 | .. | 1 | .. | .. | 2 | 4 | 2 | 4 | .. | .. | .. | .. |
| Needle Operation | 1 | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 4 | .. | .. | .. | .. | .. |
| Capsule Removed | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | 2 | .. | .. | .. | 4 | .. | 4 | .. | .. | .. | .. | .. |
| Abscission | 2 | 1 | 1 | 1 | 4 | 2 | 1 | .. | 1 | .. | .. | 1 | .. | .. | 3 | .. | .. | .. | 12 | 5 | 12 | 5 | .. | .. | .. | .. |
| Extirpation of Globe | .. | .. | 1 | 1 | 1 | .. | 1 | 2 | .. | .. | 1 | 1 | .. | 1 | 6 | .. | .. | 1 | 10 | 6 | 10 | 6 | .. | .. | .. | .. |
| Entropion and Ectropion | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | 2 | .. | 1 | .. | .. | .. | .. | 1 | 4 | 1 | 4 | .. | .. | .. | .. |
| Anterior chamber tapped | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Hancock's Operation | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 2 | .. | .. | .. | .. |
| Tarsal Cysts | .. | .. | .. | .. | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 3 | .. | .. | .. | .. |
| **Excision of Joints and Bones.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Knee | .. | .. | 1 | .. | 3 | .. | 2 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 6 | 2 | 4 | 1 | .. | .. | 2 | 1 |
| Hip | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 |

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 5 Years. | | 5— | | 10— | | 20— | | 30— | | 40— | | 50— | | 60— | | 70— | | Total. | | Cured Relieved. | | Not Relieved. | | 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 |
| **Excision of Joints and Bones (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shoulder | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. |
| Wrist | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Elbow | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 2 | .. | .. | .. | .. |
| *Removal of Sequestra:* | 1 | 2 | 2 | 3 | 9 | 3 | 1 | .. | 1 | 1 | .. | .. | .. | .. | 2 | .. | .. | .. | 16 | 9 | 16 | 9 | .. | .. | .. | .. |
| **Amputations.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Primary:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arm | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 2 | .. | .. | .. | 1 | .. |
| Forearm | .. | .. | .. | .. | 4 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 5 | .. | 5 | .. | .. | .. | .. | .. |
| Parts of Hand | .. | .. | .. | .. | Many | | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Thigh | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| Leg | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. |
| Parts of Foot | .. | .. | .. | .. | Many | | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Knee Joint | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 1 | .. | .. | .. | 1 | .. |
| *Secondary:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Thigh | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| Arm | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 5 Years. | | 5— | | 10— | | 20— | | 30— | | 40— | | 50— | | 60— | | 70— | | Total. | | Cured and Relieved. | | Not Relieved. | | 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 |
| **Amputations (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Disease:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arm | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. |
| Forearm | .. | .. | .. | .. | .. | .. | 1 | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 4 | .. | .. | .. | .. | .. |
| Hip Joint | .. | .. | .. | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 1 | .. | .. | .. | 2 | .. |
| Thigh | .. | 2 | .. | .. | 6 | 4 | 5 | 1 | 4 | .. | 1 | 2 | .. | .. | 1 | 1 | .. | .. | 17 | 10 | 14 | 9 | .. | .. | 3 | 1 |
| Leg | .. | .. | .. | .. | .. | 2 | 4 | .. | 1 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | 5 | 4 | 5 | 4 | .. | .. | .. | .. |
| Ankle Joint | .. | .. | 1 | .. | 1 | 1 | 5 | 1 | 2 | .. | 1 | .. | 1 | 1 | .. | .. | .. | .. | 11 | 3 | 11 | 2 | .. | .. | .. | 1 |
| **Removal of Tumours.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Cancer:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jaw | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | 1 | .. | 1 | .. | .. | 2 | 2 | 2 | 2 | .. | .. | .. | .. |
| Breast | .. | .. | .. | .. | .. | .. | .. | .. | .. | 5 | .. | 15 | .. | 7 | .. | 2 | .. | .. | .. | 29 | .. | 29 | .. | .. | .. | .. |
| Tongue | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 4 | .. | 6 | .. | 2 | .. | .. | .. | 12 | 1 | 11 | 1 | .. | .. | 1 | .. |
| Lip | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | 1 | .. | 1 | .. | 6 | .. | .. | .. | 10 | .. | 10 | .. | .. | .. | .. | .. |
| Vulva | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | 2 | .. | 2 | .. | .. | .. | .. |
| Penis and Scrotum | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | 1 | .. | .. | .. | 3 | .. | 3 | .. | .. | .. | .. | .. |
| Skin | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | .. | .. | .. | 1 | .. | .. | 4 | .. | 4 | .. | .. | .. | .. | .. |
| Rodent Ulcer | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | 1 | 3 | .. | .. | .. | 5 | 1 | 5 | 1 | .. | .. | .. | .. |

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 5 Years. | | 5— | | 10— | | 20— | | 30— | | 40— | | 50— | | 60— | | 70— | | Total. | | Cured and Relieved. | | Not Relieved. | | 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 |
| **Removal of Tumours (*continued*).** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Connective Tissue Tumours:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Parotid and Submaxillary | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 3 | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | 3 | 1 | .. | .. | .. | .. |
| Fatty | .. | .. | .. | .. | .. | .. | .. | 3 | .. | 4 | .. | 3 | 1 | 4 | .. | 2 | .. | .. | 1 | 16 | 1 | 16 | .. | .. | .. | .. |
| Fibro-cellular and Fibrous | .. | .. | .. | .. | .. | 1 | .. | 1 | 1 | 3 | .. | 2 | 3 | .. | .. | .. | .. | .. | 4 | 7 | 4 | 7 | .. | .. | .. | .. |
| Sarcoma | .. | .. | .. | .. | .. | .. | 1 | .. | 2 | 1 | .. | 3 | 1 | 2 | .. | .. | .. | .. | 4 | 6 | 4 | 5 | .. | .. | .. | 1 |
| Exostosis | .. | .. | 1 | .. | 3 | 3 | 3 | 2 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 5 | 7 | 5 | .. | .. | 1 | .. |
| Epulis | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | 2 | .. | .. | .. | .. |
| Enchondroma | .. | .. | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 3 | 1 | 3 | 1 | .. | .. | .. | .. |
| Sebaceous Tumours / Dermoid Cysts | .. | .. | .. | .. | 2 | 1 | 2 | .. | 2 | .. | 2 | 5 | 1 | .. | .. | .. | .. | .. | 10 | 6 | 10 | 6 | .. | .. | .. | .. |
| Tonsils removed | .. | .. | 1 | 2 | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 6 | 1 | 6 | .. | .. | .. | .. |
| Upper Jaw removed | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | 1 | .. | 1 | .. | .. | 2 | 2 | 1 | 2 | .. | .. | 1 | .. |
| Nasal Polypi | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 2 | .. | .. | .. | .. |
| Rectal Polypi | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. |
| *Adenoid Tumours:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Breast | .. | .. | .. | .. | .. | 3 | .. | 5 | .. | 4 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 13 | .. | 13 | .. | .. | .. | .. |

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 5 Years. | | 5— | | 10— | | 20— | | 30— | | 40— | | 50— | | 60— | | 70— | | Total. | | Cured and Relieved | | Not Relieved. | | 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 |
| **Removal of Calculi.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Litholapaxy | .. | .. | .. | .. | . | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| By Lithotomy—Lateral | .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 4 | .. | .. | .. | .. | .. |
| Dilatation of Urethra | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. |
| Vascular growth from Urethra | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. |
| Salivary Calculus | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. |
| **Incisions.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Colotomy | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 3 | .. | .. | 1 | .. | .. | 1 | .. | .. | 2 | 5 | 2 | 2 | .. | .. | .. | 3 |
| Abdominal Section | .. | 1 | .. | .. | 1 | .. | .. | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 2 | 2 | .. | .. | .. | .. | 2 | 2 |
| Gastrotomy | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |
| Ovariotomy | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 2 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | 8 | .. | 7 | .. | .. | .. | 1 |
| *For Hernia:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Inguinal:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Herniotomy— | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Opening of Sac | .. | .. | .. | .. | 1 | .. | 3 | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | 2 | .. | 8 | .. | 4 | .. | .. | .. | 4 | .. |
| Without opening | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 2 | .. | 2 | .. | .. | .. | .. | .. |
| *Femoral:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Herniotomy— | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Opening of Sac | .. | .. | .. | .. | .. | .. | .. | .. | 1 | 4 | 1 | 3 | 1 | 4 | 1 | 3 | .. | 1 | 4 | 15 | 2 | 11 | .. | .. | 2 | 4 |
| Without opening | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | 1 | .. | .. | .. | .. |

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 5 Years | | 5— | | 10— | | 20— | | 30— | | 40— | | 50— | | 60— | | 70— | | Total. | | Cured and Relieved. | | Not Relieved. | | 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 |
| Incisions (*continued*). | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *For Hernia:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| *Umbilical:* | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Herniotomy .. .. .. .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Hæmorrhoids— | | | | | | | | | | | | | | | | | | | | | | | | | | |
| By Excision or Ligature .. .. .. | .. | .. | .. | .. | .. | .. | 1 | 3 | 1 | .. | 3 | .. | .. | 1 | .. | .. | .. | .. | 5 | 4 | 5 | 4 | .. | .. | .. | .. |
| Osteotomy .. .. .. .. | 4 | .. | 1 | 5 | 5 | 4 | 1 | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 11 | 11 | 10 | 11 | 1 | .. | .. | .. |
| Fissure of the Anus .. .. .. .. | .. | .. | .. | .. | .. | .. | 1 | 2 | 2 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | 3 | 4 | 3 | 4 | .. | .. | .. | .. |
| Tenotomy .. .. .. .. .. | 5 | 4 | 3 | 1 | 4 | 6 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 13 | 12 | 12 | 11 | .. | 1 | 1 | .. |
| Anal Fistula .. .. .. .. .. | .. | .. | .. | .. | 1 | 1 | 11 | 6 | 7 | .. | 6 | .. | 3 | .. | 1 | .. | .. | .. | 29 | 7 | 29 | 7 | .. | .. | .. | .. |
| Tracheotomy .. .. .. .. .. | 3 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | 3 | 2 | .. | 1 | .. | .. | 3 | 1 |
| Phimosis .. .. .. .. .. | 20 | .. | 4 | .. | 15 | .. | 26 | .. | 7 | .. | .. | .. | 2 | .. | .. | .. | .. | .. | 74 | .. | 74 | .. | .. | .. | .. | .. |
| Perinæal Section .. .. .. .. .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. |
| Ligature of Vessels. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aneurism by Anastomosis .. .. .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. |
| Femoral .. .. .. .. .. .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. |

| OPERATIONS. | AGE AND SEX. | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Under 5 Years. | | 5— | | 10— | | 20— | | 30— | | 40— | | 50— | | 60— | | 70— | | Total. | | Cured and Relieved. | | Not Relieved. | | 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 |
| **Miscellaneous Operations.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nævus | .. | 7 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 9 | .. | 9 | .. | .. | .. | .. |
| Reamputation of Stumps | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Ingrowing Toe-nail | .. | .. | .. | .. | 5 | 2 | 3 | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 5 | 8 | 5 | .. | .. | .. | .. |
| Trephining | .. | .. | .. | .. | .. | .. | 1 | .. | .. | . | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Varicose Veins | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. |
| Rectum and Anus removed | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | 2 | .. | 1 | .. | .. | .. | 1 | .. |
| Radical Cure of Varicocele | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. |
| Ozœna | .. | .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 1 | .. | 1 | .. | .. |
| Bursæ, etc. | .. | .. | .. | .. | .. | 1 | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 4 | .. | .. | .. | .. |
| **Reparative Operations.** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Harelip | 3 | 5 | 3 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | 5 | 7 | 5 | .. | .. | .. | .. |
| Cleft Palate | 2 | 4 | 2 | 2 | 3 | 3 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 8 | 9 | 8 | 8 | .. | 1 | .. | .. |
| Deformity from Cicatrices | .. | .. | 1 | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | 1 | 1 | 1 | 1 | .. | .. | .. |
| Vesico-vaginal Fistula | .. | .. | .. | .. | .. | 1 | .. | 2 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 3 | .. | .. | .. | 1 |
| Ruptured Perinæum | .. | .. | .. | .. | .. | .. | .. | 4 | .. | 3 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 7 | .. | 7 | .. | .. | .. | .. |
| Ununited Fracture | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | 1 | .. | .. |
| Imperforate Anus | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | 2 | .. | .. | .. | .. | .. |
| Nerves United | .. | .. | .. | .. | 2 | .. | .. | 1 | 2 | 1 | .. | .. | 1 | .. | .. | .. | .. | .. | 5 | 2 | 5 | 2 | .. | .. | .. | .. |
| Ectopia Vesicæ | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | 1 | .. |

During the year 1879 Anæsthetics were administered 2,094 times.

| | | |
|---|---|---|
| Of these Chloroform was administered.. .. | 975 | times. |
| Nitrous Oxide Gas alone .. .. | 112 | „ |
| Ether alone .. .. .. .. | 23 | „ |
| Ether, preceded by Nitrous Oxide .. | 984 | „ |
| | 2,094 | |

One patient died of Syncope after the administration of Chloroform.

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## STATISTICS OF THE DENTAL DEPARTMENT.

| | |
|---|---|
| Number of Cases.. .. .. .. | 1,623 |
| Extractions .. .. .. .. | 1,777 |
| Stoppings.. .. .. .. .. | 288 |
| Miscellaneous Cases .. .. .. | 239 |

The extractions were largely composed of roots of teeth.

Amongst the Miscellaneous Cases were:—Five of Cleft Palate, treated by mechanical appliances; and three in which either the Right or Left Superior Maxilla had been extirpated for disease, artificial dentures were supplied; three cases of Compound Fracture of the Lower Jaw, treated by interdental wire splints; one case of Dentigerous Cyst; eight cases of Necrosis of the Upper and Lower Jaw; three cases of Transplantation of Teeth; three of Rigg's Disease; one case of Edentulous Jaws in a child aged four years; one case of Acute Necrosis of Inferior Maxilla in a child, referred to the Wards, and several cases of Ulseration of Tongue, and Fistulæ in the Cheek.

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# APPENDIX

TO THE

# TABLE OF OPERATIONS.

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TUMOURS.

Out of 47 cases of removal of tumours from the breast, three-fourths of which involved complete removal of the gland, 1 death occurred. This was a case of serocystic sarcoma, in a woman, aged 41. Recurrent hæmorrhage took place from the wound, and she eventually died from pyæmia.

*Upper Jaw.*—The upper jaw was completely removed for round-celled sarcoma four times. One of these patients, a man aged 34, died from erysipelas.

*Tongue.*—Of 13 cases of removal of the tongue, 1 died. This was a man aged 46, in whom an attack of erysipelas followed the operation, and he died of asphyxia.

During the removal of a portion of the superior maxillary bone from a woman aged 60, the breathing became difficult, the face became dusky, and she appeared to be on the verge of death. Artificial respiration was resorted to without in the least relieving the asphyxia. Mr. Savory immediately performed tracheotomy, and then passing a pair of dressing forceps down the trachæa, drew out from just above the bifurcation a large forked blood clot with a diameter of the trachæa and the corresponding bronchi. The effect produced was immediate, and in a few minutes, with artificial respiration, life was restored. The patient made a good recovery, and was discharged from the hospital in seven weeks with the trachæal wound completely closed.

AMPUTATIONS:

*Primary Amputation of Arm.*—A man, aged 30, died from erysipelas.

*Thigh.*—One man, aged 47, died from the shock a few hours after amputation of the thigh for crushed leg.

*Leg.*—Of two primary amputations at the knee joint, one boy, aged 13, died from tetanus on the fourteenth day.

*Secondary.—Thigh.*—A man, aged 45, died from exhaustion some weeks after a secondary amputation for crushed leg.

*For Disease.—Thigh.*—A man, aged 28, whose thigh was amputated for disease of the knee-joint, died during the second week from an attack of pleurisy.

A man, aged 35, whose thigh was amputated for diseased knee, died from septicæmia.

A man, aged 37, whose limb was amputated for a tumour, died from exhaustion.

A woman, aged 62, after amputation through the thigh for cancer of the foot, died from exhaustion.

*Foot.*—A woman, aged 57, died from erysipelas, after Symes' amputation for diseased tarsus.

*Hip-joint.*—A boy aged 12, died from exhaustion, and a man, aged 21, from pyæmia.

A carpenter, aged 73, died from exhaustion after amputation of the fingers of both hands.

A notable feature in the year's surgery is the number of cases of subcutaneous Osteotomy. The operation was performed upon 22 patients; in some of the cases both limbs were operated upon. Ogsten's operation was twice performed for genu valgum, and MacEwen's in 6 cases for the same deformity; section of the femur in 6 cases for rickets; section of the femur for ankylosis of the hip-joint in two cases, for badly-united bones in 4 cases; for ankylosis of the knee-joint in 2 cases.

All these cases did well with the exception of one case of division of the femur, which was followed by an attack of erysipelas two months after the operation. The patient ultimately recovered.

Incisions:

*Colotomy.*—This operation was performed 7 times. Three of the cases died. In 2 of these the operation was performed for stricture of the intestine, and in 1 for carcinoma of the vulva.

*Abdominal Section.*—This operation was performed 4 times for intestinal obstruction, in each case with a fatal result.

Ligature of Vessels:

In a case in which the femoral artery was tied for popliteal aneurism, secondary hæmorrhage occurred on the twelfth day. The wound was reopened, and the bleeding vessel for a second time tied. The patient died in a few days from acute pyæmia.

# SUB-TABLE, SHOWING THE NUMBER OF CASES OF ERYSIPELAS, PYÆMIA, &c.

| 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 |
| Erysipelas— | | | | | | | | | | | | | | | | | | | | | | |
| Admissions | .. | .. | .. | .. | 3 | 1 | 3 | .. | 3 | 2 | 3 | 1 | 1 | 3 | 2 | .. | .. | .. | 15 | 7 | .. | 1 |
| Occurring in Hospital | .. | .. | 1 | .. | 2 | .. | 1 | .. | .. | 1 | 2 | 1 | .. | 1 | .. | 1 | .. | 1 | 6 | 5 | 1 | 1 |
| ,, after Operations | .. | .. | 1 | .. | .. | .. | 2 | 1 | 2 | .. | 2 | 6 | .. | 1 | 2 | .. | .. | .. | 9 | 8 | 3 | 1 |
| Phlegmonous Inflammation— | | | | | | | | | | | | | | | | | | | | | | |
| Admissions | .. | .. | .. | .. | 1 | 2 | 6 | .. | 2 | 2 | 5 | .. | 4 | .. | 3 | .. | .. | .. | 21 | 4 | 3 | .. |
| Diffuse Cellulitis— | | | | | | | | | | | | | | | | | | | | | | |
| Admissions | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. | .. |
| Pyæmia and Septicæmia— | | | | | | | | | | | | | | | | | | | | | | |
| Admissions | .. | .. | .. | .. | .. | 2 | 4 | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 4 | 4 | 3 | 2 |
| Occurring in Hospital | .. | 1 | .. | .. | .. | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 3 | 1 | 3 | .. |
| ,, after Operations | .. | .. | .. | .. | 1 | .. | 3 | 1 | 3 | .. | .. | 1 | .. | .. | .. | .. | .. | .. | 7 | 2 | 7 | 2 |
| Phagedæna— | | | | | | | | | | | | | | | | | | | | | | |
| Admissions | .. | .. | .. | .. | .. | .. | 1 | 1 | 1 | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | 2 | 3 | .. | 1 |

# APPENDIX TO TABLE OF ERYSIPELAS OCCURRING IN HOSPITAL.

Erysipelas occurring in Hospital:

Eleven cases of simple Erysipelas occurred in the Hospital; 6 of these were in males, 5 in females. In 5 of the cases the disease followed recent injuries; 4 occurred in the course of abscesses or suppurating bursæ; 1 in an ulcer of the leg; and 1 in tubercular disease of the tongue. Of the fatal cases 1 occurred as a complication in an advanced case of tubercular disease, the other followed suppuration of the leg.

Erysipelas occurring after Operation:

Seventeen cases of Erysipelas occured after operation; 9 in males, 8 in females. 3 males died, 1 female died. The disease occurred after the following operations: Males—3 removal of tongue (1 died), 1 fistula in ano, 1 amputation of finger, 1 amputation of arm, 1 removal of jaw (fatal), 1 osteotomy, 1 hernia (fatal); females—2 removal of breast, 1 fatty tumor, 1 Symes' amputation (fatal), 1 amputation of finger, 1 hernia, 1 removal of cyst, 1 sequestrotomy.

Pyæmia and Septicæmia occurring in Hospital:

Four cases occurred in the Hospital. 1 followed a severe lacerated wound of the perinæum in a man, aged 39; 1 occurred in a butcher, aged 38, in which osteo-myelitis followed a contusion of the leg; 1 in a case of abscess with necrosis; 1 in a girl, aged 4, suffering from morbus coxæ, the child recovered.

Pyæmia and Septicæmia occurring after Operations:

Nine cases, all of which were fatal. In the males, 1 after abdominal section for intestinal obstruction, 1 after ligature of the femoral artery for aneurism, in this case secondary hæmorrhage occurred, the vessel was religatured in the wound, pyæmia following the second operation; 1 after removal of an omental tumor, 1 after amputation of the thigh, 1 after amputation of hip joint, 1 after removal of an exostosis of the tibia, 1 after resection of the knee joint. In the females, 1 followed an amputation of the breast, 1 an operation for vesico-vaginal fistula.

# TABLE OF AMPUTATIONS WITH THE PERCENTAGE OF DEATHS DURING THE TEN YEARS *from* 1870 *to* 1879 *inclusive.*

| OPERATIONS. | CASES UNDER TREATMENT. | | | | | | | | | | PERCENTAGE OF DEATHS. | | | | | | | | | | Total Number of | | Average Percentage of Deaths. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1870 | 1871 | 1872 | 1873 | 1874 | 1875 | 1876 | 1877 | 1878 | 1879 | 1870 | 1871 | 1872 | 1873 | 1874 | 1875 | 1876 | 1877 | 1878 | 1879 | Cases. | Deaths. | |
| PRIMARY. | | | | | | | | | | | | | | | | | | | | | | | |
| Thigh .. .. .. | .. | 2 | 3 | 2 | .. | 1 | 1 | 2 | 4 | 1 | .. | 50· | 33·33 | .. | .. | 100· | .. | .. | 50· | 100· | 16 | 6 | 37·5 |
| Knee Joint .. .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | 50· | 3 | 1 | 33·33 |
| Leg .. .. .. | 3 | 1 | .. | .. | .. | .. | 3 | 2 | 2 | 1 | 33·33 | .. | .. | .. | .. | .. | 66·66 | 100· | 50· | .. | 12 | 5 | 41·66 |
| Ankle Joint .. .. | .. | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 1 | .. | .. |
| Shoulder Joint .. | .. | .. | .. | .. | 1 | .. | 1 | .. | .. | .. | .. | .. | .. | .. | 100· | .. | .. | .. | .. | .. | 2 | 1 | 50· |
| Arm .. .. .. | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 50· | .. | .. | .. | .. | 33·33 | .. | .. | .. | 33·33 | 23 | 3 | 13·04 |
| Forearm .. .. | 1 | 3 | 5 | .. | .. | 2 | 2 | 2 | 1 | 5 | .. | .. | .. | .. | .. | .. | 50· | .. | .. | .. | 21 | 1 | 4·76 |
| SECONDARY. | | | | | | | | | | | | | | | | | | | | | | | |
| Thigh .. .. .. | 2 | 1 | 1 | .. | 1 | .. | 2 | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | 50· | .. | 100· | 100· | 9 | 3 | 33·33 |
| Leg .. .. .. | 3 | 3 | .. | 1 | 1 | 2 | .. | 1 | 2 | .. | .. | 33·33 | .. | .. | .. | .. | .. | 100· | .. | .. | 13 | 2 | 15·38 |
| Arm .. .. .. | 2 | .. | 2 | .. | .. | 1 | .. | .. | .. | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 6 | .. | .. |
| Forearm .. .. | 1 | .. | .. | .. | 1 | .. | .. | 1 | 1 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 4 | .. | .. |

| OPERATIONS. | CASES UNDER TREATMENT. | | | | | | | | | | PERCENTAGE OF DEATHS. | | | | | | | | | | Total Number of | | Average Percentage of Deaths. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1870 | 1871 | 1872 | 1873 | 1874 | 1875 | 1876 | 1877 | 1878 | 1879 | 1870 | 1871 | 1872 | 1873 | 1874 | 1875 | 1876 | 1877 | 1878 | 1879 | Cases. | Deaths. | |
| FOR DISEASE. | | | | | | | | | | | | | | | | | | | | | | | |
| Hip Joint .. .. | .. | .. | 1 | 1 | 2 | .. | 1 | 2 | .. | 3 | .. | .. | .. | .. | 100· | .. | 100· | 100· | .. | 66·66 | 10 | 7 | 70· |
| Thigh .. .. .. | 9 | 18 | 15 | 12 | 19 | 18 | 9 | 14 | 19 | 27 | 11·11 | 22·22 | 13·33 | .. | 10·52 | 27·77 | 11·11 | 7·14 | 10·52 | 14·81 | 160 | 22 | 13·75 |
| Knee Joint .. .. | .. | .. | .. | 2 | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 2 | .. | .. |
| Leg .. .. .. | 5 | 4 | 5 | 7 | 7 | 9 | 2 | 7 | 9 | 9 | 40· | .. | .. | 14·28 | .. | .. | 50· | 28·57 | .. | .. | 64 | 6 | 9·37 |
| Ankle Joint .. .. | .. | 2 | 8 | 8 | 9 | 7 | 6 | 5 | 15 | 14 | .. | .. | 12·5 | .. | 11·11 | .. | 16·66 | .. | 20· | 7·14 | 74 | 7 | 9·45 |
| Shoulder Joint .. | 2 | 1 | .. | .. | .. | .. | 1 | .. | .. | .. | .. | 100· | .. | .. | .. | .. | 100· | .. | .. | .. | 4 | 2 | 50· |
| Arm .. .. .. | 1 | .. | 1 | .. | .. | 2 | 4 | 4 | 3 | 2 | 100· | .. | 100· | .. | .. | .. | 25· | .. | 33·33 | .. | 17 | 4 | 23·5 |
| Forearm .. .. | 1 | 3 | 2 | 1 | 4 | 3 | 2 | 4 | 2 | 4 | 100· | .. | .. | .. | .. | .. | .. | .. | .. | .. | 26 | 1 | 3·84 |

# INDEX.

# ST. BARTHOLOMEW'S HOSPITAL REPORTS.

## VOLUME XVI.

## INDEX.