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## Original Communications.

### SOME TUMOURS OF THE INGUINAL REGION SIMULAT-ING HERNIA.*

By Francis J. Shepherd, M.D.

Professor of Anatomy and Lecturer on Operative Surgery in McGill University; Surgeon to the Montreal General Hospital.

The tumours to which reference will be made in·this paper are not glandular enlargements or new growths, but tumours caused by the incomplete obliteration of the processus vaginalis, due to an arrest of development, resulting in a connection between the peritoneal cavity and the unobliterated process. This persistent funicular process may contain omentum or simply fluid, the opening of communication being too small for the passage of bowel.

I might remind you that the tubular process of peritoneum which descends with the testicle into the scrotum is freely continuous with the general peritoneal cavity up to the later months of fœtal life. At birth the tunica vaginalis enveloping the testicle is all that normally remains of this tubular process, the obliteration first taking place at two points, viz., (1) at the internal ring, and (2) a little above the epididymis; now we have a closed tube and the sac of the tunica vaginalis. The tube shrinks into a fibrous cord and the serous sac enveloping the testicle remains as the tunica vaginalis. Occasionally the tubular process of peritoneum closes only at the lower point and a funicular process of peritoneum remains lying on the cord and continuous with the peritoneal cavity at the internal ring; in such cases bowel may be contained in the process, and this is one form of congenital hernia. But the cases of which I wish to speak are those where the closure at the internal ring commences but the obliteration is not completed. A small opening may be left, too small to admit bowel, but large

enough to allow omentum to pass, or the opening or openings may be so minute as only to allow fluid to come through by drops. These cases are always puzzling. A man presents himself with a tumour in the groin, having a history of reducibility on lying down, but of recurrence on moving about. Sometimes the tumour is tender to the touch, and handling it causes nausea and other sensations. On trying to reduce it one finds that this is not possible. In one of the cases related below it seemed as if the young man had a third testicle on the left side. The lump was tender on pressure, non-fluctuating, and squeezing it gave the same sensation as compression of the testicle ; yet he said that this tumour never was present in the morning on getting up and that after moving about for some hours it reappeared. On cutting down on the tumour a funicular process of peritoneum was found connected with the general peritoneal cavity through the internal ring by a hollow, stalk-like process, and the communication between the sac and the peritoneum was so small that fluid could only be squeezed through by drops ; hence the impossibility of reduction and the reason of the gradual formation of the tumour on going about. In another case the same condition existed in a female child in connection with the round ligament. The funicular process of peritoneum (the canal of Nuck) which accompanies the round ligament into the inguinal canal had never been obliterated. There was a largish tumour, very tender, which disappeared after the child had been lying down for some time, but always reappeared on moving about. Here the same condition was found, a sac with a stalk-like process connecting it with the peritoneal cavity, the opening being so small as to be almost invisible. The shape of the sac was very like a'Florence flask.

In cases where the opening is larger omentum may be found in the sac as well as fluid. Such a case is reported below, where a small piece of omentum was attached to the bottom of the sac and where the patient had worn a truss for years with great discomfort and had frequent attacks of pain, vomiting and purging. When the omentum and sac were removed these all disappeared. It is not uncommon to find in young male infants a swelling in the groin which gives the mother considerable uneasiness. This usually comes on suddenly, is of considerable size, may be tender on pressure, but it is fluctuating and transmits light. In such cases the obliteration of the sac at the internal ring, I take it, has not been sufficiently solid, and during the strain of crying perhaps it has given way sufficiently to allow peritoneal fluid to percolate through into the yet unobliterated tube of peritoneum. In fact, a funicular process is thus sometimes established. These cases need excite no alarm and usually get well if left alone.

If the fluid does not disappear tapping may be resorted to, and if this does not do the sac can be dissected out. Encysted hydroceles of the cord often originate, in this way the upper opening again closing—but of course, as a rule, their growth is slow and is due to the secretions from the unobliterated tubular portion of peritoneum between the internal ring and epididymis of the testicle.

In not a few of these cases of persistence of the funicular process there is also present an infantile sac which may or may not contain bowel. This sac is also congenital, as shown by its close connection with the spermatic cord, and it is situated behind the funicular process. I have operated on several such cases, but always for the radical cure of hernia. On cutting down one first reaches a sac which may contain fluid, as does a hydrocele sac, and bulging into this is a second sac which contains the enterocele. In such cases care must be exercised not to inadvertently cut the vas deferens, which above at the neck of the sac is always internal and behind, but below, may cross over the fundus of the sac, and so run the risk of being wounded.

I have seen many cases of these fluid tumours treated by a truss in the belief that a hernia existed. If the truss be put on in the morning before the fluid has re-accumulated a cure may result, but in other cases the fluid accumulates in spite of the truss and causes much pain.

CASE I.—*Hernia of omentum with the funicular process—Recurrent attacks of pain—Operation—Cure.*

H. L., æt. 22, a tall, strong, healthy-looking young man, was sent to me for radical cure of hernia on March 26th, 1896, with the following history : In March, 1887, following exposure to cold, he was seized with severe pains in the left inguinal region, which after some time extended to the lower zone of the abdomen. This pain was accompanied by severe purging, the stools being very watery. Soon after he noticed a swelling in the left groin ; this swelling at times disappeared, but always returned when lying down, especially at night. There has always been a dull, aching pain in the left groin since he first noticed the lump. Since the first attack of pain and purging in 1887 he has often been laid up with similar attacks, but none so severe as the first. Sometimes these attacks last two or three days, sometimes two weeks. Since the first week in January he has dragging pains in his groin, but has not noticed any swelling. Wears a truss. On examining him I found some thickening about the left cord in the inguinal canal and somewhat beyond it ; there was also a slight varicocele. Nothing like a hernia to be felt. He says the dragging pains are now constant in inguinal region and lower part of

the abdomen and that he has almost continual nausea. He insisted on me cutting down and seeing what the matter was, so on March 29th, having prepared patient as if for a radical cure of hernia, I cut down over the thickening in left inguinal canal and found a thin sac with a narrow neck continuous with the internal ring and the peritoneal cavity. In this sac was a small piece of omentum tightly grasped by the internal ring and attached to the lower end of the sac, which as it emerged from the canal was somewhat large, the whole being the shape of a Florence flask. The lower part of the sac was closely adherent to the tunica vaginalis. Closely adherent to the posterior surface of this sac was the cord, which was spread out considerably, the vas deferens being some distance away and internal to the vessels. The sac was opened, the omentum tied off and the sac closed by catgut ligature and cut off below this. As the external ring was rather large its columns were brought together with two strong catgut sutures and the omentum sutured with horse-hair. No drain used. The patient recovered rapidly, the wound healing by first intention. Since then I have heard from him and he says he has now great comfort, no more pain or nausea, and he feels like a different man. This was no doubt a case of unobliterated funicular process into which omentum has been forced during his first attack of colic, and this dragging on the omentum accounted for all the pains and nausea he had suffered from for years.

CASE II.—*Swelling in left inguinal region and scrotum simulating hernia—Operation—Cure.*

Thos. H., æt. 21, was admitted into hospital May 16th, 1895, complaining of a swelling in the left groin and scrotum, which at times pained him severely.

*History.*—In December, 1894, following a strain, patient perceived a swelling descending into the left side of the scrotum about the size of a pigeon's egg; he had severe pains in the groin and back. These pains disappeared and he returned to work and found that whenever he put forward the left leg the pain returned, while at rest the pain disappeared. In the morning the swelling would have all disappeared. At first the swelling disappeared entirely for a week, then returned when he went about and disappeared slowly on lying down—that is, he went to bed with the swelling well marked and on waking in the morning it had disappeared; on rising it took some hours before the swelling reappeared and was its proper size. After a time the swelling ceased to pain him, and it was not until he began to play football in March last the pain returned severely and he consulted a doctor who told him it was probably a rupture. He tried to reduce it, but

could not, and ordered him a suspensory bandage which relieved the pain. He again played football and again the pain returned, so he determined to enter hospital for operation.

On examination I found on left side of scrotum a couple of inches above the epididymis and reaching up to the inguinal canal a tense, hard swelling the size of a large olive. This was very tender and felt like a third testicle. The patient said on pressing it firmly all the sensations of pressing a testicle were produced. The external ring could be felt, but nothing but the cord was in it. No fluctuation could be felt. No impulse on coughing and no vomiting. He was put to bed and next day no trace of the swelling could be found, nor could it be made to reappear by coughing or straining or moving about. The boy then for the first time informed me that the swelling would not come on for some hours after he had been at work, and was only fully developed by the afternoon. I immediately concluded we had to deal with a funicular sac with a small opening, through which fluid slowly percolated.

On May 17th I cut down and found a flask-shaped sac attached below to the tunica vaginalis, which over-lapped it, and ending above in a narrow neck which entered the internal ring. There appeared to be only a pin-hole connection between the peritoneal cavity and this sac, which was now empty. Spread over it behind was the spermatic cord and vessels. The sac was excised and the large rings closed with catgut sutures and the edges of the skin wound brought together with horse-hair. A rapid recovery took place, the wound healing by first intention. Since then the boy has been perfectly relieved of his pain and discomfort.

CASE III.—*Tumour of the left groin simulating hernia and due to a persistent canal of Nuck.*

Fanny W., æt. 2½ years, was brought to the Montreal General Hospital June 18th, 1895, suffering from a painful tumour in the left groin.

*History.*—When three months old she had whooping cough, and during this period the parents first noticed a small lump in the left groin near the pubic spine. This lump disappeared and reappeared at intervals. It was always seen after a crying fit.

On June 15th last the child fell from her carriage, and soon after the lump on the groin was found to be much larger and to remain so. It was tender on pressure.

When seen the child, which was a healthy female, presented a tumour the size of a small hen's egg in the left groin, commencing

above the external abdominal ring and proceeding downwards and inwards.    It was tense, tender, non-fluctuating and dull on percussion. It could not be reduced, nor was it translucent.    No elevation of temperature and no symptoms of strangulated hernia were present.    The child was admitted and next morning the tumour was only about half the size and much less tense.  Next day it had disappeared entirely. The parents took the child home, but returned in a day or two with the tumour as large as ever.    Operation was advised and consented to.

On June 24th the child was etherized and the parts prepared as if for a radical cure of hernia.    An incision two inches long was made over the tumour, which was now of small size owing to the child having been quiet and in bed for twenty-four hours.    After cutting through the skin, a thick layer of fat, and fascia, a sac was reached which contained fluid.    This was dissected out and found to be connected with the peritoneum by a stalk-like process which passed up into the abdomen with the round ligament through the inguinal canal. The sac was tied off and the wound closed.    The connection with the peritoneum was so fine that a small probe could not be passed, but water could be made to percolate into the sac below through minute openings.    The wound closed by immediate union and the patient was rapidly convalescent and discharged from hospital in ten days.

This sac was without doubt a portion of the process of peritoneum which descended through the inguinal canal with the round ligament and remained unobliterated; in fact it was a persistent canal of Nuck.

CASE IV.—*Tumour of left side of scrotum suddenly appearing and simulating hernia.*

A. R., æt. four months, a healthy male infant, who had never any symptoms of swelling about the groin, was brought to me on June 28th, 1895, with a tumour in the left scrotum and with the following history :    The night previous, after a severe crying fit, the nurse noticed a large swelling in left side of scrotum.    This was tender and red, and ever since the child had been restless and uneasy.

On examining it I found a large tense swelling above the left testicle and which extended into the inguinal canal.    It was tender and increased when the child cried or sat up.    The tumour was very tense and elastic, irreducible and dull on percussion, but on testing it with transmitted light was found translucent,    I immediately came to the conclusion that it was a case of re-opening of an imperfectly obliterated funicular process and advised a cooling lotion and rest. In a week I saw the child again.    The tumour was somewhat smaller, but still as tense and elastic as ever.

There were no constitutional symptoms and the child slept and nursed well. So I told the parents there was nothing to fear and that probably the swelling would disappear of itself, if not, a small operation, which they much dreaded, would easily cure the case.

A month later the tumour had almost entirely disappeared and there was nothing much noticeable about the scrotum. Whether it will reappear, of course, is uncertain, but at such a tender age it is probable that the closing process will recommence and that the separation from the peritoneal cavity will be permanent.

# REMOVAL OF THE MEMBRANA TYMPANI AND OSSICLES.*

By F. BULLER, M.D.

Ophthalmic and Aural Surgeon to the Royal Victoria Hospital, Professor of Ophthalmology and Otology, McGill University.

It may be of some interest to members of this Association, not engaged in special practice, and who have limited opportunity for dealing with diseases of the ear, to learn what progress is being made by otologists in the management of morbid conditions which come especially within the scope of aural surgery.

A complete report on this subject would occupy much more time than the regulations as to time-limit will permit for one communication.

I shall, therefore, confine my remarks to a consideration of one surgical procedure which seems to have gained a firm foothold and an acknowledged value, within the past few years, though not even yet practised by all otologists. I refer to excision of the membrana tympani and one or more of the ossicles. Although this operation was proposed by Schwartz as early as 1873, and performed in fifty cases reported by Lucæ in 1885, it is only quite recently that Sexton, of New York, brought it prominently before the profession.

For a time hopes were entertained that in this operation we had found a means of successfully combating the common inveterate forms of chronic catarrhal otitis media. A more mature experience of the results obtained by the operation in this class of aural disease has, however, thoroughly quenched an enthusiasm which the mere prospects of so great a boon naturally aroused. Nevertheless the operation has proved to be of immense benefit in a common, and in some respects still more serious, form of middle ear disease.

Everyone who has had occasion to treat many cases of chronic suppurative disease of the middle ear can bear witness to the intractable nature of this affection in a large proportion of such cases, despite the most approved methods of cleansing and the most thorough use of antiseptic treatment. The failure of such treatment is due to several causes. First, there is the impossibility of reaching all the diseased parts in very many instances; and, secondly, the presence of disease of the bony structures involved in the inflammatory process. The diseased bone may be in the walls of the tympanum, in the ossicles, in the mastoid, or in the deeper parts of the external auditory canal, but by far more frequently in the two former.

Now, it is just in these that the operation in question is destined to prove of enormous benefit. Undoubtedly the same end may be achieved by either of two other operative procedures, which, however, are a great deal more formidable than the simple myringectomy and removal of diseased structures by way of the external auditory canal. I refer to Stacke's operation, and the equally radical operation of clearing out the tympanum through the mastoid.

I do not propose to describe any of these operations, since a full account of them may be found in several recent large treatises on otology. I merely wish to emphasize the fact that myringectomy and removal of the ossicles is a perfectly rational, simple, safe, and commonly efficient operation in many cases of chronic suppuration of the middle ear, which are practically incurable except by operation. After this operation the patient is able to go about, and if necessary attend to business, on the following day. The after treatment is exceedingly simple; it consists in changing the antiseptic tampon every day or two for a short time; and even when a discharge occurs, as it will after a few days in some instances, there is much better drainage of the diseased parts than before the operation, and with this, the ordinary antiseptic and cleansing measures are likely to be more efficient than before.

If removal of the ossicles and curetting of any diseased part of the tympanic walls does not suffice to thoroughly remove diseased structures and arrest the discharge, at least no harm has been done, and there will be no greater difficulty in more thoroughly exposing the tympanum in some other way should this be deemed advisable as a last resort. The operation probably never increases existing impairment of hearing, but, on the contrary, often leads, either immediately or within a short time, to a marked improvement. This indeed is the rule where there are no pre-existing labyrinthine complications. The thick and swollen tympanic structures, instead of conducting aerial vibrations to the labyrinth, have lost their proper function, and are better out of the way. It must, however, be borne in mind that the chief object of the operation is to free the patient from the constant menace to life which a persistent middle ear suppuration carries with it.

On this point I am disposed to believe that neither the general profession nor the public are by any means alive to the gravity of the danger to life which a persistent suppuration of the middle ear carries with it.

Unfortunately there is no means of discovering how many cases of meningitis, inflammation of the brain, supposed typhoid fever, etc., as

they appear in mortuary statistics, are in reality the final and fatal issue of chronic suppurative otitis media.

My own observations, though necessarily limited in this direction, lead me to suppose that the proportion of deaths from this cause is very much larger than statistics would seem to indicate or than most people are willing to believe. It is, therefore, a long step in the right direction if we have found out how to cure many of the hitherto intractable cases of suppurative otitis media.

I will now give the outlines of a few cases which I have operated upon within the past year. The results on the whole have so far been satisfactory, and I am confident they will be still more so in the future.

CASE I.—Miss A., age 22, a slight, delicate young woman, has had chronic discharge from the right ear since childhood, but not constantly. Hearing reduced to contact for the watch.

At long intervals has had several attacks of intense headache and threatened mastoid disease. These attacks have always been relieved by removal from the ear of deep-seated accumulations of cholesteatomatous material, mingled with fœtid secretion, with the free use of antiseptic fluids by means of the middle ear syringe, together with counter-irritation of the mastoid. Her chief complaint is of frequent and severe headaches, which she attributes to the diseased ear. The general health is impaired, but from no other discoverable cause.

The local conditions are a thickened, retracted and much distorted drum-membrane, with perforation of the upper posterior quadrant. The discharge is scanty and collects as a fœtid greenish crust over the perforation and along posterior wall of meatus.

Several courses of local treatment in the past four years have not materially altered the local conditions.

On the 3rd of October, 1894, under ether anæsthesia, I completely removed the distorted drum-membrane, and malleus. The incus was not found. A quantity of epithelial debris was found in the vault of tympanum. After removal of this the ear was thoroughly syringed with solution of perchloride of mercury 1 in 4000, and the tympanum lightly packed with iodoform gauze, dusted over with iodoform and boric acid. This dressing was renewed every second day for a week, when it was found that the middle ear had become dry and free from odour and the hearing improved to two inches for the watch. This improvement has been maintained up to the present time. The general health is very good and there is entire freedom from headache.

CASE II.—A. K., æt. 14. His only complaint is a constant discharge from the left ear, with tendency to headache and nose-bleed.

Some three months ago, after an attack of epistaxis there was pain in the diseased ear, tenderness over the mastoid, intense headache and vomiting. The threatened cerebral complication passed off after about two weeks' treatment of the ear.

In this case the purulent otitis media dates back to an attack of measles at the age of five years. All the usual remedies employed in this form of ear disease have failed to arrest the discharge for more than a few weeks at a time. The discharge is usually a thin pus of a somewhat offensive odour.

The malleus is *in situ*, but the membrana vibrans is pretty well all destroyed. The visible portion of the tympanic mucous membrane is moist and slightly granular.

On the 15th of September I removed the remains of drum membrane, malleus and incus and dressed the now free tympanic cavity with absorbent cotton pledgets dusted with iodoform powder. For two days there was a considerable oozing of blood, which necessitated changing the dressing several times daily. A firmer packing might have arrested this more promptly, but fearing the retention of septic material which might have escaped removal at the time of operation, I preferred changing the dressing as required. The bleeding finally ceased and at the end of ten days the ear had become quite dry and healthy and has remained so ever since. Hearing has improved from half inch for the watch to nine or ten inches. Has no more headaches and the general health is all that could be desired.

CASE III.—May 10, 1895. Mrs. M., æt. 35. Chronic suppurative otitis media of left ear for twenty years or more. Discharge not profuse, but very fœtid. For the past six months has suffered greatly from a dull pain which she locates about an inch above and an inch and a half behind the meatus, and has an intense nervous dread of the brain becoming affected.

The lower two-thirds of the membrana vibrans is absent, remaining portion of membrane thick and red, malleus intact, but directed straight inwards. Hearing=contact for the watch. A thin, grey, purulent secretion constantly accumulates in the lower part of the drum cavity; no treatment has the slightest effect in relieving this condition.

June 15, removal of the membrane and malleus, incus could not be found. Patient was going about as usual the next day without pain or discomfort in the ear.

In ten days the ear appeared to be entirely aseptic and there was complete relief from all disagreeable sensations on the head. This, I have been informed, has been permanent and the hearing has im-

proved considerably: when last tested it was three inches for the watch. The ear discharges very slightly at times and is not entirely free from odour, but the distressing symptoms in the head are gone.

CASE IV.—A. R., æt. 23, servant girl, first seen May 3rd, 1895. Right ear discharging rather freely since age of 18; came on after an attack of measles. Only upper half of membrane present; this is much thickened and very red, so also is the visible portion of tympanic mucous membrane. Hearing=six inches for the watch.

Has been treated for the "running ear" several times without benefit. The probe discovers no evidence of bone disease, though the discharge from the ear is usually highly offensive.

Local treatment until June 26th without appreciable benefit, then the remains of the drum membrane and malleus were removed. Prolonged and careful search for the incus, but without success, although the appearance of the articular surface of the malleus seemed to indicate that it must have been present.

After freely curetting the tympanic cavity it was dressed in the usual way.

Hearing for two weeks after the operation was reduced to one inch for the watch, but on the 15th of August was again six inches.

The ear continues to discharge, though much less than formerly, and the patient is well pleased with the improvement.

It is likely the failure to find the incus is an explanation of the imperfect result in this case.

CASE V.—F. P., æt. 20, a strumous looking youth, has been much annoyed by a fœtid discharge from the right ear for the last ten years or more, but has never experienced more than a slight temporary relief from treatment.

The auditory canal was found filled with epithelial débris and fœtid secretion. When this had been thoroughly removed the deeper portion of the auditory canal was found narrowed and a thick mass occupied the position of the upper portion of the malleus. A month's treatment reduced this swelling sufficiently to show that the malleus was imbedded in the mass, but in other respects there was no improvement. Hearing remained as at first, the watch on pressure. There were frequent headaches and the same fœtid discharge.

On April 17th excised the malleus and with it the remains of incus, the long process being absent and the body partially destroyed by caries.

For a month after operation there was no discharge and hearing improved to two inches for the watch. Since then there has been a slight return of the discharge and some fœtor. It is probable there

is at some part a small area of diseased bone which as yet I have been unable to discover.

CASE VI.—Miss W., æt. 23. For many years right ear discharging constantly; is much troubled with dizziness and headache. Hearing=0. Tuning fork not heard in right ear; left ear normal. Several months' treatment have given very little relief. Only that portion of the drum which lies above the folds remains. The malleus is *in situ*, buts its long process is wanting.

June 20th removed remains of drum membrane, and body of malleus. Cleared the vault of tympanum of an accumulation of epithelium, etc., but could not find incus. No reaction followed the operation, though the manipulation was unusually prolonged owing to persistent bleeding. In this case a new membrane, or at least a dry epithelial lining, was formed over the entire visible portion of drum cavity, except at the lower and posterior part; here there is granulation tissue sprouting from a small cavity in the bone which emits a thin discharge of a peculiar metallic odour.

She has been free from pain in the head and dizziness since the operation. Hearing remains=0, as before. This might be expected in the absence of bone conduction before operation.

CASE VII.—A. B., æt. 14, a healthy boy, except that right ear constantly discharges since he had scarlet fever some six years ago. Suffers no other annoyance or discomfort. Hearing=six inches for the watch.

Membrana vibrans absent. Malleus retracted so that its extremity rests against the promontory. Visible tympanic mucosa fairly healthy in appearance. The discharge comes from the upper portion of the tympanic cavity and has not been arrested by treatment, which, however, cannot be properly carried out on account of interfering with his occupation.

July 15th removed remains of drum, malleus and incus; no reaction followed.

August 1st, there is only a slight moisture of the tympanic mucous membrane, which is thin and pale. Hearing is somewhat better than before operation, now being eight inches for the watch.

*Resumé* of seven cases as recorded above:

CASE I.—Complete cure of discharge; marked improvement in hearing and of general health.

CASE II.—Complete cure of discharge and improvement in hearing.

CASE III.—Relief of head symptoms, improvement of hearing, and almost complete arrest of discharge.

CASE IV.—Condition improved materially, but a moderate discharge

of a more healthy character continues, and there appears to be a good prospect of recovery.

CASE V.—Considerable improvement, but discharge not completely arrested.

CASE VI.—Good result; relief from head symptoms; discharge altered in character and lessened.

CASE VII.—Good result; discharge cured and hearing decidedly improved.

NOTE.—In this last case, examination of the ears on August 31st, there is found a still further improvement in hearing, which is now fifteen inches for the watch.

# THE NERVE CENTRES OF RESPIRATION.

By Allen M. Cleghorn, M.D., etc., London, Ont.

So much progress has recently been made in the study, both physiologically and anatomically, of the nervous system that I venture to think that this short paper, dealing with the important subject of the nervous system of respiration, will not be out of place. But, before proceeding to discuss the nervous mechanism of the respiratory centres, perhaps a glance at the historical and comparative portion of the subject would not be uninteresting.

Let us first turn to the history of the physiology of respiration, and trace rapidly its course from ancient times up to the present day. The first man to make observations on respiration was Aristotle, who thought that the act of respiration was to cool the blood and so govern internal warmth—this was in the year 384 B.C. His observations were correct, that the warmest animals breathed the quickest, but as we now know he reversed the cause and effect. About the years 131-203 A.D., Galen put forth the idea that the "soot" of the body was removed with the water expired; he also noted that the lungs passively followed the movements of the chest, and that the diaphragm was the most important muscle concerned in respiration, and that the external intercostals are inspiratory and the internal intercostals expiratory in action. Galen gave the impetus to research in the respiratory phenomenon. He divided the intercostal nerves and and muscles and observed the loss of voice incurred, and, on division of the spinal cord higher and higher, he found that the chest muscles lying higher up became paralyzed. Oribasius (360 A.D.) observed that the lungs became collapsed in double pneumo-thorax. In 1540 Vesalius used artificial respiration to restore the beat of the heart. Malpighi described the structure of the lungs in 1661, and from now on we progress more rapidly. Borelli elucidated the mechanism of the respiratory movements in 1679. Carbonic acid was detected by Van Helmont, and a century later Joseph Black found that the same gas, or "fixed air" as he called it, was given out during expiration. The discovery of oxygen by Priestley, in 1774, was the next most important event. A year later Lavoisier discovered nitrogen, he regarded the expired gases as the direct result of combustion in the lungs themselves. The existence of carbon dioxide in venous blood was pointed out by Vogel, and then Hoffman proved the presence of oxygen in arterial blood; but only after Magnus had extracted the gases of

arterial and venous blood, and analyzed them, wast it possible to understand the complex gaseous changes in any degree.

We will now take a look at the comparative physiology of the respiratory apparatus. Mammals have lungs similar to man ; in birds they are united to the chest wall, are spongy, and have openings on the surface communicating with thin-walled "air sacs," which are distributed among the viscera and communicate with the bones ; birds have no diaphragm.

In reptiles there is a greater and lesser compartment as lungs, but in snakes one is abortive and the other elongated. Amphibians, when young, breathe like fishes, by gills, but later on they have two simple lungs. Some even retain their gills through life as do the perenni-branchiate amphibians. Fishes have a swim bladder, besides their gills, and this may be compared to a lung. The Cobitis respires with its intestine. Centipedes and insects breathe by tracheæ distributed about the body and at one end opening on the surface ; these orifices can be closed at will. Crabs, Molluscs and Cephalopods have gills Spiders respire by tracheæ and tracheal sacs. Gasteropods have not only gills, but lungs also. In the lower invertbrates, some have gills, others breathe by a special water vascular mechanism, and others have no special organs whatever.

We will now proceed to the study of the nerve centre and its mechanism. If in a few of the experiments given below some of the results seem curious as regards the vaso-motor and heat producing or internal respiratory changes, remembrance must be had of the fact that these centres are closely allied to the respiratory centre. The bulb is supreme over respiration and the cord subordinate to the medulla.

The vagi are the afferent and efferent nerves of the gill arches, but in mammals they are the principal afferent fibres of the respiratory centre, their efferent influence being confined to the larynx ; the facial nerve is efferent to the nose and the spinal nerves to the thorax.

The first attempt to demonstrate the mechanism of the nerve centre of respiration was made by Legallois, in 1830. He showed that an animal continued to breathe after the cerebellum, cerebrum and part of the bulb had been removed, but that the roots of the vagi must be left intact. Flourens showed that the regular movements of the face and jaw took place during asphyxia, provided the facial nerve was not divided ; in this he separated the nuclei of the facial and vagi nerves. The act of respiration is involuntary and automatic. This is shown by the fact that an injury done to the vagi roots stops respiration ; breathing will continue for a short time, however, after divison of the bulb above the vagus roots ; but a warm-blooded animal soon dies, as the

heat production, internal respiration and vaso-motor centres are cut off—and so the warm-blooded animal is a cold-blooded one.   Should a section be made just below the vagi roots, all movements of respiration, except those of the nose and jaw, are lost.   The reflex sensory effects from the cornea and nose are all done away with if a section be made of the bulb just below the tubercula acustica.   Rhythmic movements of the nostrils are also lost, the centres for the facial movements being either above or transversed by the line of section.   A section immediately below this is the first to affect the movements of respiration, and, as Markwald points out, the results resemble those of division of both vagi in the neck.   This shows that the highest part of the centre governs or is connected with the regulatory fibres of the lungs.   It will be shown below that these fibres enter the bulb through the "glosso-pharyngeal root," as it is termed.

A transverse section at the level of the ala cinerea causes irregularity of the respiratory movements.   Sometimes the movements become periodic, and, after passing through all the stages of asphyxia, the respiration stops.

A section below the calamus abolishes respiration and reflexes.

Lallemand has given us some valuable information as to the limits of the respiratory centre.   His results were obtained from anencephalous monsters in which life had been prolonged for as much as four days.   The cerebrum and cerebellum being destroyed, during birth, in a fœtus, respiration occurred regularly six times a minute after complete section had been made of the bulb 1 cm. above the calamus scriptorius.

Galen found that division of the cord between the first and second cervical vertebræ was followed by death; with division between the third and fourth, natural respiration was lost.   The diaphragm remained in action when the section was below the sixth cervical vertebra, the muscles of the thorax being stationary—lower down the muscles were movable; should artificial respiration be kept up, rhythmic movements of the face continue.   Accidents in man demonstrate the correctness of Galen's observations.

Isolation of the bulb from the cerebrum and cerebellum, above and from the rest of the cord by section below the sixth cervical, when both vagi are divided, does not affect the diaphragm, which remains in action.   But should the lower section be made higher up the cord the diaphragm ceases to act.   In the frog one can destroy the cerebrum and mesencephalon, and divide the cord behind the atlas, destroying the lower portion of the cord, and extirpate the lungs and heart, and though no peripheral stimulus can now reach the bulb, yet regular

movements of the nose, mouth and vocal cords go on and traces of thoracic movements can be detected.

The above demonstrates the fact that the bulb governs respiratory movements, and a connection between the spinal nerve roots and the bulb is a *Sine qua non.* Some authorities have held that the large ganglion cells in the anterior horn of the cord cause the movements of the respiratory muscles and that the bulb simply co-ordinates and governs the whole. This opinion was based on the results of the experiment just mentioned. Brown-Sequard has noticed the rhythmic movements in new-born animals that were kept warm. They are found also in young animals when strychnine has been administered. Wertheimer and Rokitansky described the rhythmic movements in adult dogs in which artificial respiration had been kept up for a couple of hours. In these cases it must be recollected, however, that the cord is in an extremely excitable condition, and, therefore, all reflexes are exaggerated, and consequently rhythmic movements may occur in the face and limbs. Whether these rhythmic movements of the muscles aid respiration is perhaps questionable.

The only positive evidence we have of an inspiration occurring after separation of the cord from the medulla is furnished by Langendorff's experiment on the tortoise in which, after division, the inspirations became very much less and were followed by a forced expiration. From this experiment, then, we must admit that inspiratory stimuli can proceed from the subsidiary centres in the cord of the tortoise.

The usual inhibitory effects following section of cord are probably due to shock following division. However, Brown-Sequard always maintained that respiration was dependent on nervous centres distributed throughout the cord and the base of the brain. He drew attention to the effect of tumours involving the cord and medulla and to the results of dislocation of the odontoid process of the axis.

If a small portion of the medulla, the limits of which are not clearly defined, but lying below the vaso-motor centre and in the vicinity of the centres for the vagi, glosso-pharyngeal and facial nerves, be injured or destroyed, respiration ceases; hence Flourens called this spot the "nœud vital." This is *the* respiratory centre. It consists of two lateral halves which work synchronously together, as proved by the fact that if the bulb be delicately divided in the middle line, respiration goes on as usual; but now on division of one vagus, the costal and diaphragmatic respiratory movements become slower on the same side as the divided vagus, and a stimulus confined to one vagus affects that side only, and a lateral section of one-half of the cord just below the bulb stops thoracic respiratory movements on that side.

Although the main respiratory centre is said to be situated in the medulla with subsidiary centres in the cord, other observers locate centres in different parts of the brain.

Kohts locates a coughing centre on each side of the raphe, in the neighborhood of the ala cinerea. Christiani claimed a cerebral centre for inspiration in the optic thalamus, in the floor of the third ventricle, which is stimulated through the optic and auditory nerves. When it is stimulated directly, the inspiratory movements are deepened and accelerated, and it may even cause the respiration to stop in the inspiratory phase. This centre may be removed, and after this an expiratory centre is active in the substance of the anterior pair of the corpora quadrigemina. Martin and Booker describe a second cerebral inspiratory centre in the posterior corpora quadrigemina. These three centres are, of course, connected with the centre in the medulla. Markwald claims that not only the posterior quadrigemina but also the sensory nucleus of the trigeminus is concerned in maintaining regular respiratory rhythm. Yet other subordinate "cerebral respiratory centres" are described, Ott found that on stimulation of the tissue between the corpus striatum and optic thalamus the number of respirations was greatly increased. If this centre be destroyed a dyspnœic respiratory acceleration caused by heat (heat dyspnœa) ceases.

Spencer, however, points out that the above experiments do not point to a centre, but claims that the nerve tracts leading from the cortex to the respiratory centre in the bulb were stimulated; on experiments made on the dog, cat, rabbit and monkey he demonstrated four different areas on the cortex cerebri that gave definite results. The first area is situated upon the frontal lobe, outside the olfactory tract and anterior to the point where it joins the temporo-sphenoidal lobe; the olfactory limb of the anterior commissure, where the tract decussates, gave the same results, which varied in different stages of anæsthesia. The deeper the anæsthesia the greater the tendency to arrest in expiration. Lighter anæsthesia arrest was in either full inspiration or in over-inspiration. Respiration usually began again at normal rhythm immediately the excitation ceased. The next cortical area which on stimulation affects respiration is around the infraorbital sulcus in the dog and cat, and is similar in the rabbit and monkey; the tract runs backward through the lenticular nucleus to the tegmentum. The result of stimulation of this area is marked acceleration. On stimulation of the area mentioned below an irregular, convulsive respiratory movement takes place. A sharp over-inspiration, followed by a similar expiration, and several such movements

follow the application of the stimulus, but at regular intervals and in a rhythmic manner. This action does not cease with the stimulus, but three or four may follow the cutting off of the current. The area that causes this is the olfactory tract (mucous membrane of the upper part of the nose, will give the same result), and it may be traced back to the uncinate convolution, and from thence into the crus, the two tracts meeting at the upper border of the pons. The next tract yielding results is the sensori-motor area and the descending motor tract on the cortex ; naturally these can be gained by stimulating the central end of any sensory nerve, particularly the fifth. Strong stimulation causes a tonic contraction of the diaphragm and the ordinary muscles remain in action. By means of the over contraction of the extraordinary muscles the chest seems to be in the stage of over inspiration

It is obvious that these four areas mentioned above can be acted on by the will.

The bulbar centre can be affected in several different ways : first, stimulation of the vagus ; second, stimulation of the cortex ; third, stimulation of all sensory nerves ; and fourth, stimulation of the centre itself in the floor of the fourth ventricle.

We will first discuss the action of the vagus nerve, and in this will follow Mr. Spencer's description, physiological and anatomical, of the vagus, separating it entirely from the spinal accessory (so-called), The bulbar portion of the spinal accessory is in reality a part of the vagus, although associated and running with, for a short way, the spinal accessory nerve proper. It joins the ganglion of the trunk of the vagus, but some of the fibres appear to run over the ganglion and so pass into the pharyngeal and superior laryngeal branches. Microscopically the difference between the two nerves is easily recognizable, as in structure of the spinal accessory resembles a motor nerve in the coarseness of its fibres, while on the other hand the fibres of the vagus are much finer and resemble the white rami communicantes of the sympathetic system. Separating the fibres in each root is a considerable quantity of nucleated connective tissue, and all the fibre have ganglion cells upon them. Again, the spinal accessory is absent in fishes and snakes and in animals higher in the scale, the rule may be laid down that the extent of its development is in direct ratio to that of the neck muscles, while the vagus is constant in vertebrates. The two nerves can be separated by very careful dissection and the microscope also shows that there are distinctly separated by a connective tissue sheath. In the rabbit, mule, horse, ass and dog all the roots of the vagus are closely or entirely united and the spinal accessory runs distinctly apart. In the cat there is a closer connection between the

lower bulbar roots and the spinal accessory. This resemblance between the vagus and the sympathetic system is not surprising when we remember that in cyclostomes the vagus and sympathetic run together as far as the anus, and that in mammals the vagus is connected with the superior ganglion of the sympathetic which sends branches to the ganglia of both the root and trunk of the vagus, and that there is also an intimate connection through the annulus of Vieussens, in the pulmonary and cardiac plexuses, and lastly that in the abdomen the two nerves completely intermingle. McLaughlin even describes the right pneumo-gastric as extending down far enough to supply the glans penis.

In experimenting on the vagus with an electric current it must be remembered that as there is no gap between the roots of the vagi, consequently it is very easy for the current to spread, and if dissection is attempted injury may be done to the roots and so we will get an inhibitory result. The following table expressing the functions of the vagus is taken from Mr. Spencer's Arris and Gale lecture delivered before the Royal College of Surgeons of England.:

|  |  | Afferent. | Efferent. |
|---|---|---|---|
| Vagus. | Upper roots IX Nerve | Regulatory fibres of Resp. (lungs) Fibres exciting resp. (Insp.) Sup. Laryngeal. | Crico-thyroid. Stylo-pharyngeus. Œsophagus. Pharynx (constrictors) |
|  | Middle roots X Nerve | Fibres inhibiting Resp. (expir.) Bronchial (cough) | Gastric Bronchial (muscular) |
|  | Lower roots of Bulb |  | Inf. Laryngeal, Cardio-inhibitory, |
|  | Spinal Accessory. "Nerve of Willis"=XI Nerve. |  | Levator palati and azygos. Sterno-mastoid and Trapezius. |

The fibres that come from the lung enter the medulla by the highest roots, as is seen by the above table. On division of these roots the same result is produced as results on division of the vagus in the neck; on stimulation of these fibres in the monkey, only slightly anæsthetized, the effect is an excitation of respiration. Should the stimulus be greatly increased there is a great tendency to arrest inspiration or to over-inspiration. A very strong stimulus, when anæsthesia is deep, applied to any of the roots may cause arrest of expiration, but the middle roots cause the arrest with the weakest current. The fibres that react most readily on the heart are those coming off from the bulb lowest down (bulbar portion of spinal accessory, so-called).

The pulmonary branches of the vagus contain the following fibres :

1. Afferent fibres, which, in general, when stimulated quicken inspiration by raising the excitability of the respiratory centre ; sometimes, however, the effect is to slow respiration. These are fibres which when stimulated during forced expiration cause a fall of blood pressure by lowering excitability of vaso-motor centre.

2. Inhibitory fibres to the heart.

3. Motor branches to the smooth muscle of the bronchi and bronchioles.

4. Vaso-motor nerves to the pulmonary vessels.

5. Cough-exciting fibres (superior laryngeal).

Let us now consider the nerve fibres that carry impulses from the periphery to the respiratory centre.

On stimulating sensory nerves of all kinds the tendency is to quicken or excite inspiration. This, as we have seen, is reflexly due to the will and therefore no result is obtainable on an animal under the influence of an anæsthetic. Should the stimulation be too strong respiration may be stopped, but only by the contraction of the opponent muscles of ordinary respiration. A good example of sensory nerves stimulating inspiration is seen on the application of cold water to the skin, but the spasm of respiration that occurs in the last stage of drowning is not due to the sensory influence, as it occurs in animals under the influence of a narcotic. It cannot be due to the cold, as it occurs in water at the temperature of the blood. On excitation of the fibres entering the bulb by the middle roots of the vagus the floor of the fourth ventricle and an area of the cortex cerebri (described above) respiration may be inhibited, particularly when the animal is deeply anæsthetized. The difficulty in getting acceleration of respiration by stimulating the floor of the fourth ventricle is probably due to the unsteadiness of the current, thus spreading to the inhibitory centre. On stimulation of the fifth nerve through the nose we get a tonic inspiratory result, and on stimulation of the olfactory fibres a clonic inspiratory result. The nerves of the nose being sensory no inhibitory result is obtainable in animals under an anæsthetic, but inhibition may be got in animals in full possession of their senses. Blow an irritating vapour into the nose of a rabbit and you will find that it holds its breath.

Let us now turn to the influence of the blood on the respiratory centre. It can be stimulated through this medium in different ways: (1) deficiency of O in the blood, (2) by excess of O in the blood, (3) by too much $CO_2$, (4) by products of muscular metabolism present and (5) by variations in the temperature of the blood. We will now briefly discuss these conditions :

1. Reduction of the amount of O in the blood naturally excites respiration. If the quantity of O present in the blood is small hyperpnœa results, if the amount is still further reduced loss of consciousness ensues.

2. Blood containing a large quantity of O stimulates a failing centre, but if the centre is normal it produces an excitable condition and stimulates the centre so much that apnœa does not occur.

3. The presence of 3.5 per cent. of $CO_2$ in the air breathed causes hyperpnœa (Haldane). If the air contains 5 per cent. the rate of breathing has to be doubled to allow the blood to gather enough O. If $CO_2$ be mixed with air from which the O has not been extracted, about 7 per cent. of $CO_2$ can be inspired without ill effect, the quickened respiration bringing in enough O.

4. In the rabbit, weak lactic acid acts as a direct stimulus to the respiratory centre, and in exercise or work, owing to the diminished alkalinity of the blood as more $CO_2$ and lactic acid the product of muscular metabolism is thrown into it, respiration is quickened and so the amount of O and $CO_2$ in the blood is kept normal. In the horse the quantity of O inspired and $CO_2$ expired is increased during work, but the respiratory quotient is not altered.

5. On gently heating the blood in the carotid artery respiration will be quickened, or the animal may be placed in a warm chamber and on raising the temperature the same result will be noticed. During this experiment the animal cannot be made apnœic and shows great resistance to narcotics. If sufficient heat be applied to raise the rectal temperature 1° C. the respiratory rate may be doubled.

Having discussed the different ways of exciting the respiration through the blood we now find that the action of the centre may be lowered in the following ways :

1. By excess of $CO_2$ to the extent of asphyxia, and by poisons, as narcotics, etc.

2. By diminution of the amount of $CO_2$ in blood.

3. Impairment of the circulation through the centre.

In asphyxia we have a series of peculiar changes, and these phenomena may be said to be due to the centre of respiration suffering from want of O owing to the failure of the circulation. In the first stage, that of prolonged expiration, the blood pressure rapidly rises, but it soon falls again, due to the vaso-constrictor influences becoming paralysed. In the same manner is the heart affected, and so the failure of the circulation is due to paralysis of the vaso-motor centre and the heart muscle.

The heart continues to beat very slowly after the cessation of

breathing and may continue for some time.  I have observed the
heart of a man beating three minutes after respiration had stopped.
This was in an unfortunate being executed in Ontario for murder.
The auricular beat outlasts the ventricular contraction.  If the ven-
tricles are still beating inflation of the lungs will restore the heart's
force and blood pressure.  Sir J. Eric Erichsen and Professor Sharpey
restored the circulation when the heart had ceased beating for two
minutes by using O instead of air for inflation.

Inhibitory impulses to breathing may be overcome by starting
afferent impulses, exciting inspiration ; a simple and efficacious plan
is to draw forward the tongue in a rhythmic manner, but naturally if
the patient is in the third or comatose state of asphyxia no result can
be obtained.  Should the blood pressure rise on stopping artificial
respiration it is almost certain that breathing will be resumed, if it
falls respiration will not return.  A person who has been submersed
for a long time and respiration stopped and is then revived must be in
such a state that internal respiration was depressed at the time of
submersion, and so the amount of $CO_2$ in the tissues was small and
consequently the heart continued beating.  $CO_2$ is not the only poison
that effects the respiratory centre.  On the application of cocaine to
the floor of the fourth ventricle respiration is paralysed, on removal
respiration is resumed.  Chloroform and ether act much in the same
way when directly applied.  Of course hydrocyanic acid and carbonic
oxide gas act much more quickly.  If O can be administered quickly
enough and the gas got rid of, recovery is possible.  Haldane placed a
a mouse in a glass chamber and passed a stream of carbonic oxide
through it.  The effect was rapid on the mouse, which panted and fell
on its side, while its ears became a reddish colour.  He then passed a
stream of O through and the animal quickly recovered.

If a stream of ozone be passed through a solution of curare it (the
curare) rapidly loses its poisonous properties.  It is believed, there-
fore, that curare withdraws O from the nerve tissues.  Strychnine
does not stimulate respiration, but opposes or inhibits inspiration by
acting on the nerve roots that supply the muscles of extraordinary
expiration.  It is the ataxic and clonic action of these muscles that in-
hibits inspiration.  The respiratory centre becomes asphyxiated by too
much $CO_2$ and the abdominal muscles are violently contracted by each
spasm, obviously then the treatment of a case of strychnine poisoning is
extremely difficult ; for to get rid of the depression of the over-action
of the respiratory muscles by narcotics, while artificial respiration with
O is kept up so as to prevent the centre being asphyxiated, is no easy
matter.

Let us now turn our attention to apnœa. If artificial respiration be employed on an animal at the ordinary temperature of a room, it is rapidly cooled, and as we have seen that apnœic pauses are difficult to obtain when an animal is over-heated, conversely then it is now possible and even easy to obtain long ones. Man can, by practice, hold his breath for some time, even over a minute, but first he must take several deep breaths. The absorption of the O in the lungs is aided by the gradual contraction of muscles of respiration favouring the entrance of the O into the blood. This is the case in whales.

It must be remembered in discussing apnœa the close relations existing between the centres of respiration, of heat regulation and vascular control. The first two are closely allied in warm-blooded animals, for the excess of $CO_2$ produced by the production of heat must be thrown off, but owing to the low state of the excitability of the heat-regulating centre in a new-born animal the animal is practically a cold-blooded (more or less) one. Puppies furnish a good example of this, as at first they react like cold-blooded animals, their temperature rising and falling with that of the surrounding medium, and the amount of $CO_2$ given out is in direct ratio to their temperature. An unhatched chick resembles a cold-blooded animal, but it gains a heat-regulatory mechanism earlier than the puppy, as it runs about soon and so has control of its muscles. A premature fœtus resembles a cold-blooded animal, for little $CO_2$ is produced and so the centre of respiration is not excited, but in a full-term child the centre is excitable enough to be influenced by any increase or decrease of $CO_2$ in the blood, above or below that amount existing in the mother's blood.

If the arterial circulation be cut off from the uterus in a pregnant animal, the fœtus will breathe "in utero." Ordinarily in the fœtus the venous state of the blood is sufficient stimulus to the centre, but should the centre be from any cause weakened respiration may not take place and so death result. The simple entrance of O in the first breath increases the excitability of the centre, stimulates internal respiration, and by distention of the lungs diverts circulation through them. Should a fœtus be apnœic a sensory stimulus may cause it to inspire O and so raise the excitability of the centre, but, as we have seen above, if the fœtus is in a state of asphyxia it responds to no sensory stimuli. Cold is a bad stimulus, as it tends to lower the excitability of the centre.

Hybernating animals become cold-blooded and their circulation becomes extremely feeble. There is no respiration and only a small amount of $CO_2$ is produced. An atmosphere containing enough $CO_2$ to kill a rat is borne with ease by a hybernating dormouse. In

short, hybernating animals' respiratory centres are in a state of apnœa. Asphyxia is produced in a warm-blooded animal by a too rapid production of $CO_2$, but should the animal have a large amount of blood containing a quantity of O and a good tension in the lung, asphyxia may be delayed. Paul Bert's experiment demonstrates the significance of a large amount of blood carrying plenty of oxygen.

He took a fowl and a duck and plunged the former under water and found that it was soon distressed, bubbles of gas escaped from its lungs, it fell over and the corneal reflex was lost in about two minutes, and after a series of inspirations it was dead in about three minutes. The duck, on the other hand, remained under water seven minutes without making an expiration. Its heart beat much slower and even fell from 90 to 20 a minute, the desire for O not being shown for about ten minutes, then the animal lost consciousness and its reflexes, let air escape, became convulsed and died. The above great difference in the two birds cannot be due to the duck's habit of diving as their behaviour is exactly similar when both their tracheæ are clamped, the duck lives much the longer again. The air sacs and lungs are similar in the two birds. Paul Bert found that the duck contains one-third more blood than the fowl, weight for weight. On abstracting about half the quantity of blood from the duck it died as quickly as the fowl.

The peculiar phenomenon of Cheyne-Stokes respiration first noted by Cheyne, afterwards more fully investigated by Stokes and hence called by their united names, is a rhythmic and periodic respiratory act seen in certain diseases and when the blood supply to the brain is interfered with. The respirations are shallow at first, but each succeeding respiratory act is deeper than the preceeding one until a maximum is reached, and then they gradually become shallow again and a pause occurs, during which no respiration takes place, in fact a state of apnœa exists. Sir James Paget expressed the view that rhythmic nutrition causes rhythmic movement, but the movement becomes periodic when the cells are dying as is seen in a dying heart It may be explained by the theory that the time is lengthened for the storing up of inogen before the kinetic force is expended in an inspiration. Periodic respiration is seen in children asleep, "Biot's respiration." In this there is no variation in the depth of the respiratory act and it is also observable after doses of morphia and chloral. It is the normal manner of breathing in the Myoxus during hybernation and intercranial pressure may produce it. The excitability of the centre is lowest during the pause. If a frog's aorta be ligatured on its removal afterwards the frog exhibits the Cheyne-Stokes pheno-

menon. Again we have here an additional proof of the close relation-
ship existing between the vaso motor centre and the centre of respira-
tion If we produce periodic respiration in an animal mechanically we
will get an exaggeration of the Traube-Herring curves, at the same
time conversely this alteration in the blood pressure, as shown by the
curves, may influence a failing or weak respiratory centre. Knoll
claims that periodic respiration is often the result of reflex action.
There is nothing in this phenomenon to show why recovery should
not take place even when the Cheyne-Stokes state of respiration has
existed for months.

We may conclude with a glance at some of the changes exhibited in
respiration under different intracranial pressures. At first increased
pressure is excitatory, so much so as to cause inspiratory spasm
followed by a slowing of the rhythm, diminution in depth and finally
paralysis of all respiration. As seen in cranial or cerebral hæmor-
rhage when the first symptom is panting and deep inspirations com-
pression of the carotids alone is sufficient to quicken respiration.

The intracranial pressure being kept up it will be readily under-
stood that a mean pressure may be maintained, should a clot or
foreign body be present in the brain, by the displacement of an equal
amount of cerebro-spinal fluid into either the canal of the cord or the
lymphatics, the pressure of the cerebro-spinal fluid being, between the
blood pressure in the veins and that in the capillaries, equal to about 10
or 15 mm. mercury. Should the pressure be applied slowly it may be
borne without noticeable symptoms, but sudden pressure at once pro-
duces excitatory symptoms. Sir Astley Cooper trephined a dog and
applied pressure with his finger on the meninges. He found that the
dog at first lost consciousness, then became comatose and the heart's
action slow, but on removing his finger the animal recovered.

Spencer and Horsley use a thin rubber bag filled with mercury to
apply pressure; they found that the cranial contents could be dimin-
ished about 5 cc. without symptoms. They obtained the same symp-
toms on direct pressure on the bulb that they obtained by pressure on
the cerebrum. The heart recovers first on the removal of the pressure
and consequently this is followed by a rise of blood pressure, then, as
we have seen above, respiration re-commences. The heart slow at
first, labours still more as carbonic acid accumulates in the blood.

If artificial respiration be carried out at the same time the pressure
is applied, the heart beats quicker and there is an increase of blood
pressure, in fact similar to that following division of both vagi, when
a very high pressure may be obtained and breathing may be resumed
in spite of the intra-cranial pressure, which with a normal blood

pressure would stop respiration at once; however, blood pressure soon falls if the pressure is continued for any length of time.

It has been demonstrated that the lenticulo-striate artery is a direct continuation of the internal carotid and is therefore submitted to a greater blood pressure than the surrounding arteries. Naturally, then, pressure on the carotids would lower the pressure enough to allow a clot to form on the lenticulo-striate should hæmorrhage occur. Artificial respiration will keep the heart and centre from asphyxia, and as respiration fails first this should be persevered in until enough cerebro-spinal fluid shall have been removed to make room for the clot and so compensate for the increased pressure.

Direct pressure on the upper part of the cord, artificial respiration being kept up, stops breathing but does not affect the heart. Pressure on the upper part of the floor of the fourth ventricle will slow the heart but quicken respiration; when applied to the lower part of the same ventricle both the heart and respiration are slowed; this is the usual result of intercranial pressure.

# Clinical Reports.

## APHASIA WITH LEFT HEMIPLEGIA.

By JAMES BELL, M.D.,

Surgeon to the Royal Victoria Hospital; Consulting Surgeon Montreal General Hospital; Professor of Clinical Surgery McGill University.

Authentic reports of cases of left hemiplegia, with complete aphasia, due to a localized lesion, are sufficiently rare to justify the publication of the following facts :  On the 11th of March, 1895, I saw, in consultation, a young man about 30 years of age who was suffering from an acute painful condition in the left hypochondrium which it was thought might require surgical treatment  The spleen was large and very tender, and the patient was suffering from a severe valvular lesion of the heart, which had followed a heavy lift in November 1894.  There was both aortic and mitral insufficiency and a greatly dilated heart, with a loud double murmur at the aortic orifice and a systolic murmur at the mitral.  There was no doubt in my mind that the acute splenic condition was due to embolic infarction and that no surgical interference was indicated.  In fact the prognosis was as bad as possible.  On the 21st of March the patient suddenly became paralyzed on the left side and completely aphasic.  He remained conscious and died rather suddenly on the 23rd of March, two days after the onset of the hemiplegia.  When these facts were communicated to me I wrote his physician for further particulars (to verify them), and learned among other things that the patient had been a left-handed man.  There was no autopsy, but there can be no reasonable doubt but that the cerebral lesion, as well as the splenic, was of embolic origin.

# TWO CASES OF VOLVULUS OF SMALL INTESTINE.

By Robt. C. Kirkpatrick, M.D.

Demonstrator of Surgery McGill University, Surgeon to Montreal General Hospital.

I have had under my care two cases of this unusual condition presenting such widely different symptoms that I thought it would be of interest to bring them before you to-night.

The first case, Lizzie M., aged 30, entered the Montreal General Hospital November 16, 1894, complaining of pain in the abdomen and vomiting. For a week previously she had had cramps in the upper part of the abdomen. Two days before admission pain came on in the epigastric and right inguinal regions, becoming more severe until by evening the pain was constant and stabbing in character. The next day vomiting came on and the following day she entered the hospital. Since the beginning of the trouble the bowels have not moved. We found her condition on examination as follows: The skin is of a subicteroid hue and the conjunctivae are yellowish. She lies on the right side with legs drawn up, but is very restless. Abdomen tense and a little distended, tenderness on pressure, especially in epi- and hypogastric regions. McBurney's point painful, but not markedly so. No tumour; tympanitic note all over, but liver dulness not obliterated. Temperature 100.6°, pulse 78, respiration 32.

The condition remained about the same until the 19th, when it was decided to operate. The vomiting continued and no movement of the bowels was obtained, although some flatus was passed. During the whole time the distention of the abdomen did not become great, nor was there any tumour to be made out.

The operation was an exploratory incision made in the middle line above the umbilicus. The gall-bladder was found normal, but on withdrawing the small intestine from the abdominal cavity a curious condition of affairs was found. The part first withdrawn was collapsed, then came a deep constriction in the gut, then about three feet of intestine and finally another deep constriction. There were no bands or adhesions and the bowel was drawn out very easily from the abdomen. The large intestine was found much distended, therefore the incision was extended downwards, passing to the left of the umbilicus, in order to permit of the examination of the sigmoid flexure and rectum. Nothing, however, was found to account for this condition and the abdomen was closed. The recovery was uneventful and the

patient left the hospital on December 19th, thirty days after the operation.

The second case, Wm. R., aged 19, presented a very different clinical picture. On April 21st he complained of a little uneasiness in his bowels with some swelling of the abdomen. During the afternoon he went to stool twice, but noticed nothing unusual. From time to time he had had similar attacks, so did not pay much attention to his sensations. However, while at supper the same evening, about 5.45, he was suddenly seized with intense stinging pain in the abdomen. His brother assisted him upstairs to his bedroom and loosened his clothing. While doing so he noticed that the patient's abdomen was swollen, hard and tender. There had been no vomiting and no diarrhœa. Dr. Drummond saw him soon after and sent for me. When I saw him about 7 o'clock he was lying partly dressed on his bed on the right side with his legs drawn up. His lips were livid and his finger nails were also cyanosed. He was suffering severely and was quite conscious. Any attempt to move him gave great pain, consequently the examination was rather superficial.

The abdomen was greatly distended, very tense and tender. Liver dulness apparent, but note tympanitic elsewhere. There was a history of having been shot in the left side, just below the heart, and from this he dated all his abdominal troubles.

The patient was brought to the hospital and as soon as preparations could be made the abdomen was incised in the middle line below the umbilicus. No signs of peritonitis were found, but the small bowel was collapsed. After withdrawing about three feet of this a distended portion was come to—about eight inches in length—with a deep constriction at each end; beyond this the bowel appeared normal. The distended portion was dark in colour, but had not lost its natural lustre, and hot cloths being applied it soon regained its normal appearance. The abdomen was closed and the patient made a good recovery.

In giving his history he spoke of attacks to which he was subject and which he referred to as fainting spells and attacks of dizziness. Subsequent investigation showed these to be epileptic fits of the *petit. mal* variety, but at the time they made the history still more confusing, as he referred them to some stomach disturbance and appeared to think that they were connected with the attacks of abdominal pain.

In neither of the cases had we any symptoms which might be termed diagnostic, nor is it usual to have any such symptoms in cases of volvulus. The only symptom which they had in common, outside

of the usual symptoms of obstruction, was the decubitus; both lay on the right side with the legs drawn up. It is easy to understand how, in a case of sigmoid flexure with a long mesentery, this condition may occur, but in the small intestine, even with an elongated mesentery, the mechanism is more difficult of explanation. The two ends of the sigmoid flexure are not far apart and the looseness of its attachments varies much in different subjects. If the loop of bowel is long and loosely attached, one limb of the flexure may be twisted over the other and so obstruction formed. This occurred in a case which I saw some years ago at the General Hospital.

Taking into consideration the frequency of hernia and the fact that this condition must always be more or less accompanied by elongation of the mesentery and that consequently this state of the attachments of the bowel is far from being uncommon, while according to all writers on surgery volvulus of the small intestine is a very uncommon occurrence, we cannot attach much importance to this point. In fact I have not come across any satisfactory explanation of why it should occur.

It may be questioned whether these were cases of volvulus at all. The total absence of bands or adhesions of any kind, the distinct points of constriction and the absence of inflammatory conditions practically rule out all other conditions. Besides this evidence by exclusion, in the second case there was more direct proof—the twist could be readily reproduced outside of the abdomen.

The happy result in these two cases, although I must admit the diagnosis was not made until the abdomen was opened, would encourage us to operate early in cases of obscure gastro-intestinal disease where we have symptoms of obstruction. In the second case the pronounced symptoms had only lasted four hours, yet the bowel was already turning black and before long would have become gangrenous. The mere drawing out of the bowel loosened the twist and no difficulty was experienced in returning the abdominal contents.

Up to the present time there has been no return in either case, seven months and two months respectively.

In concluding I wish to thank Dr. Armstrong for his kind assistance at both operations.

# CASE OF ASPHYXIATION BY ILLUMINATING GAS.

## ADMINISTRATION OF OXYGEN—RECOVERY.

By J. SHILLINGTON, M.D., Ottawa.

A young man, æt. about 30 years, went to bed between the hours of 12 and 2 o'clock on the night of May 24th. The stop-cock of the gas-jet in his bedroom was improperly adjusted and the gas escaped into his bedroom until 11 o'clock next morning, when a chamber-maid perceived the odour of gas and gave the alarm at the office of the hotel. The clerk immediately entered the room, turned off the gas and opened the door and window. I was immediately summoned and hastened to my patient, who was almost pulseless and in a most profound state of asphyxiation; respirations were very shallow and heart-beat almost inaudible. I found that his bowels had moved very freely, the stool being dark and very offensive. He was immediately removed to another room, through which a good, strong breeze of fresh air was blowing. Artificial respiration was carried on; the jaws, which were clenched, were opened and a gag placed between his teeth, the tongue being seized by a pair of forceps and drawn forwards. The heart being weak I gave him 1-30 grain of sulphate of strychnine hypodermically and bled from the arm. The heart's action seemed to increase somewhat and respiration to improve when this was done, but soon began to weaken, when strychnine sulph. 1-60 grain was injected, which again increased the heart's action. I should have stated that my friend, Dr. C. R. Church, was also sent for and considered artificial respiration too laborious and decided on using a battery (interrupted current) over the phrenic nerve, the positive pole being placed on the neck from the ear to the clavicle, the negative being placed over the region of the diaphragm and almost as low down as the pubes, the positive pole being held on the neck while the negative was interrupted in its position and not being used longer than from five to twenty or perhaps thirty seconds. This caused deep inspiration and for a time the general condition improved. I should also state that an electric brush was used which seemed to act better than the sponge. Occasionally this brush was applied to the tip of the nose and this seemed to assist respiration and rouse our patient. Oxygen was thought of, but we had no appliances by which we could manufacture it, and our patient about four o'clock in the afternoon began to show signs of sinking rapidly; our battery solution had become weak and a second battery was procured. The Ottawa University

was mentioned as a source from which we might obtain oxygen, and a telephone message to Professor Williams (professor of chemistry), stating the object for which it was required, caused him to leave his class to make the oxygen for us. Rubber bags with stop-cocks were sent in cabs to us, and the tube with the inhaler was detached from a gas cylinder and in the end of this was placed a cork through which a hole was bored and in this the tap was placed, the inhaler placed over the nose and mouth, the stop-cock turned on and pressure made on the rubber bag to expel the oxygen, at the same time the battery being used over the phrenic nerve to cause deep inspirations. From four to six or seven inhalations of oxygen were given, and then our patient's face became dark when we removed the inhaler and turned off the oxygen. In from ten to fifteen minutes this was repeated, and after using our new remedy (oxygen) a very short time we were rewarded with marked signs of improvement. At about 8.30 p.m. our patient had recovered sufficiently to recognized pain and to groan when the strong current of electricity was applied to his body, or more particularly when the electric brush was applied to the tip of his nose. When asked if it hurt him he replied "Yes." About 10.30 p.m. he could speak a little, but only answered "yes" or "no" when he was asked questions, but all of these were answered correctly. In all I think about twelve or fifteen gallons of oxygen were used. I am thoroughly convinced that had it not been for the oxygen which we administered our patient would have died. His recovery was slow and his appetite was very bad, his bowels constipated and his head ached violently, while there were pains in his arms and legs which he described as being rheumatic in character. The voice was husky for about five days. The temperature varied from 99° to 102° for about the same time. A powder containing ten grains of calomel with one grain of ipecacuanha was given on the second night, followed by a wineglassful of Rubinat water in the morning, which caused his bowels to act freely four times. Tincture of iron with strychnine was administered for several days and in about a week he had recovered.

# A CASE OF TUBERCULAR MENINGITIS WITH HEMIPLEGIA AND APHASIA—AUTOPSY.

By CHARLES W. F. GORRELL, M.D..

Medical Superintendent Robert Garrett Hospital for Children, Mount Airy, Md., U.S.A.

Patient, J.G., male, æt. 11 years, white, came into hospital on July 6th, 1895, complaining of pain in the head, and with the following history : On June 29th, 1895, the patient after riding on the street cars, came home and partook of a heavy supper. Immediately afterwards he vomited, and complained of frontal headache. During the night the patient slept well. He remained in bed during the morning of June 30th, appearing dull and sleeping most of the time. He vomited again at supper time, his headache became intense, but soon disappeared and the patient again passed a comfortable night. On the following days the lad remained about the house, being drowsy and sleepy and complaining of dizziness every time he assumed the erect position. Since July 4th the patient has not vomited, the dizziness has disappeared and since then, up to the time of entrance into hospital, he has only complained of headache. There is no history of any attacks of epistaxis, diarrhœa, sore throat, cough or night sweats. The patient never had any of the exanthemata, nor has he had middle ear disease.

*Family history*—Father alive and well, aged 32 years. Mother alive aged 34 years ; is troubled with a cough, and says she has had hæmorrhages and night sweats. The last hæmorrhage was three months ago. Patient has one brother and two sisters alive and well. One brother died of " spasms" aged two years and seven months.

*Present condition*—The patient is a fairly nourished boy ; mucous membranes of a good colour ; skin dry ; malar eminences flushed ; tongue coated, but red at the tip and edges ; appetite fair ; bowels constipated. Pulse 72, full, easily compressible, regular in volume and rhythm. Temperature at 4 p.m., 102° ; respirations 36.

Cardiac and respiratory systems normal.

No distension nor tenderness of the abdomen. No rose spots. Liver and spleen not enlarged.

Pupils equal, reacting to light and accommodation ; no strabismus ; no nystagmus ; no conjugate deviation ; nothing abnormal detected in the fundus. No tender spots can be detected about any of the orifices of the cranial nerves.

The urine is acid, of a pale straw colour ; specific gravity 1022 ; no albumen ; no sugar. Ehrlich's reaction not present.

*Treatment*—Rest in bed, milk diet ; ice cap to the head ; calomel one-tenth of a grain every hour.

July 8th. The temperature ranges from 101-5° a.m. to 102-8° p.m. : the pulse from 64 to 116 ; respirations 30 to 34. Patient slightly delirious at night.

July 10th. Condition much the same. Pulse occasionally assumes a dichrotic character. Patient dull, bowels constipated ; no enlargement of the spleen ; no rose spots. Blood cells regular in shape and size. No leucocytosis.

July 15th. Since July 10th the temperature has remained high, from 101 to 102-8°. This morning it fell to 98-4°. The pulse has fallen as low as 52. The patient has been quite rational and wanted to get up and play with the other children. At noon he was quite cheerful and asked for an increase in diet. About midnight the nurse noticed the patient raise his right arm, with fingers extended and separated in a condition of tonic spasm. When seen a few minutes later the patient's eyes were wide open, the pupils dilated, left rather more so than right ; both reacted slightly to light ; the retinal veins were dilated and somewhat tortuous. There was slight delirium. Pulse 144, regular, and easily compressible. Shortly afterwards convulsions set in which were confined chiefly to the right side. The muscles of the head and face were first affected ; then the right arm and leg. The left arm and leg were only slightly affected. These spasms recurred at short intervals during the greater portion of the night.

July 16th. 6 a.m. Although all the right side is now paralyzed, the patient is apparently conscious and can understand when spoken to, but cannot answer questions. When the mouth is opened, the jaw is pushed to the right side, while the face is drawn to the left. On shewing the teeth, the lip is drawn much higher on the left side than on the right. Grasp of the left hand good and he is able to move the left arm and leg freely. 7 p.m. Patient voided urine naturally ; seems to be quite rational and motions with his left hand for anything he requires. When trying to talk he utters a deep gutteral sound.

July 17th. 1 a.m. Spoke several times but very indistinctly. Is very restless. 8 a.m. Can move right arm and leg slightly. Grasp of right hand very feeble. Can articulate well. No motor or sensory aphasia.

July 20th. Since July 17th patient has been very dull. Temperature ranging from 100° to 102° Pulse from 60 to 80. Has had three convulsions involving the right side of face and right arm. Rests with his knees drawn up and complains of headache.

July 25th. Patient has been comatose since yesterday. Inconti-

nence of urine and fæces.   Abdomen scaphoid.   Slight internal strabismus of left eye.   Temperature 99°, rectal.

July 24th. Patient comatose.   Temperature 105° ; pulse 140 ; respirations 52.   Died at 5.10 p.m.

*Examination of the brain four hours after death.*—Dura mater was adherent to the pia and arachnoid over the central convolutions on the convexity of the brain.   On the left side the upper part of the ascending frontal and ascending parietal convolutions were thickly studded with deposits of miliary tubercules, each nodule being whitish in colour and about the size of a pin's head.

On the right side the upper part of the ascending frontal convolution had several nodules of miliary tuberculosis, but they were not so well marked as on the left side.   At the base of the brain there was a slight matting of the membranes about the perforated spaces, with a few whitish deposits.   The left middle cerebral artery was covered with small miliary nodules.   Only two or three of these lesions were detected on the right middle cerebral artery.   No thrombosis could be found in either of the vessels.   Both lateral ventricles were much distended with a clear fluid.   The internal capsule on both sides was normal.   An examination of the thorax and abdomen could not be obtained.

As a rule in children of this age the onset of tubercular meningitis is seldom very acute, there usually being a period during which the child shows some failure of health, loss of weight, etc.   Rarely, as in this case, do the acute symptoms set in without any prodromata. the patient being apparently perfectly well until the attack of vomiting came on.   This attack lasted for six days and was accompanied by the other symptoms common to the first stage of the disease.   Another unusual feature was the lucid period occurring immediately after a prolonged series of convulsions.   The child recovered from a convulsion at 5.15 p.m., July 15, and at 5.55 p.m. he was quite conscious and motioned for articles of food and drink.   For a period of five days the patient's intellect seemed to be in about the same condition as on entrance into hospital.   During this period the pulse showed marked improvement, falling from 145 per minute to 65, and remaining during this period between 65 and 80, being strong, full and regular in volume and rhythm.   It is a well recognized fact that these stages of apparent improvement do occur, as in a case in the Montreal General Hospital in the early spring of 1894.

Oxley (*Liverpool Med.-Chir. Journal*, July, 1885) points out that in a few cases of tubercular meningitis shortly before death there is an apparent improvement, the intellect becoming clear and the patient appearing almost in a normal state.   He also states that it is very rare to have the pulse partake of this improvement, it generally remaining rapid and weak.   In this case when the patient again became comatose the pulse rapidly rose to 140 and was feeble.

# A RARE FORM OF DISLOCATION OF THE HIP—EVERTED DORSAL DISLOCATION.*

By H. S. SHAW, M.D.,

Assistant House Surgeon, Royal Victoria Hospital.

A. M. R., aged 39, came to hospital complaining of deformity and uselessness of his right lower extremity. While at work, September 5th, 1894, unloading large cases of plate glass from a flat car, a case fell over the end of the car, and crushed the patient to the ground underneath it. He was treated for three months in the nearest hospital for fracture of the shaft of the femur, compound fracture of leg, and injuries to the foot. Since leaving the hospital the leg has improved but the foot is painful and the patient cannot lean his weight on it.

The limb presents no eversion, but considerable shortening—2½ inches—of which 2 inches is due to shortening of thigh and half an inch of the leg. There is marked flattening of the buttock and a much altered gluteal fold. The head of the bone is felt on the dorsum, well forward in front of the great trochanter and just below the anterior superior spine, and is freely movable in a kind of socket which exists there. All the ordinary movements of the joint can be performed by manipulation with certain limitations, but sometimes there is slight discomfort and a creaking sound. Nelaton's line passes just below the trochanter instead of above it, and Bryant's triangle also shows the upward displacement markedly.

In addition to the hip condition, slightly more than half way down the thigh, the callus thrown out around the femur at the seat of the fracture can be felt, and at this point there is a slight angularity outward.

The leg shows the compound fracture wound, and also the scar of a deep penetrating wound on the interior tibial region, which has severed muscles and nerves, and given rise to drop foot and impaired circulation and sensation over the area supplied by the anterior tibial and musculo-cutaneous nerves.

The hip condition presents a form of dislocation which has been very rarely described. In the common dislocation on to the dorsum ilii, the thigh at the time of the injury is usually in a flexed position. The head of the bone being forced backward through the capsular ligament, the outer limb of the Y ligament is put on the stretch and fixes

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* Read before the Montreal Medico-Chirurgical Society, June 14th, 1895.

the trochanter, while the head being free passes up on to the dorsum i.e., inversion of the limb is due to the outer limb of the Y ligament; and, experimentally, according to Bigelow, if the outer limb is ruptured, the foot can be freely everted.

In the present case the injury occurred with the limb in the extended position and the head of the bone being driven directly upward to the dorsum, stretched the outer limb of the Y till it was ruptured. The force usually producing inversion being absent, the muscular action of the obturator internus was sufficient to cause eversion. Thus we have an everted dorsal dislocation, classed by Bigelow as an anomalous or irregular form as it involves rupture of part of the ilio-femoral ligament.

The absence of eversion of the foot in the present case is explained by the fact of the fracture having occurred at the same time as the dislocation. The limb being set in the straight position has knit with the axis of the condyles almost at right angles to the axis of the head and trochanter, instead of in a parallel axis.

# TWO CASES OF POISONING BY ATROPINE.

By Alfred S. Wade, M.D., St. Lambert, P.Q.

On June 3rd, 1892, I was called to see Mrs. D., æt. 30, an out-patient of the eye department of the Montreal General Hospital, who was said to have taken poison. I hurried to her residence and found an empty half-ounce bottle on the table marked "Gt. At. grs. IV." On enquiry I found that the bottle had just been received full of the medicine on the previous day, and that she had swallowed its contents in the presence of her husband. He at once hurried for me and I arrived on the scene very shortly after the poison had been taken.

When seen by me she was in a condition of wild delirium, the pulse 150 and the pupils fully dilated. I at once injected a $\frac{1}{10}$ gr. apomorphine hypodermically, and succeeded almost immediately in producing free emesis. After that I injected $\frac{1}{4}$ grain of morphine and an hour later injected $\frac{1}{8}$ grain more of the same drug. The patient gradually improved and in the course of a few hours had regained her full consciousness. Beyond extreme dryness of the throat no other untoward symptoms occurred. In this case about two grains of the alkaloid must have been swallowed.

CASE II.—On May 7th, 1895, about 5 p.m., I received an urgent call to see a little girl who had eaten a box of sugar-coated pills. The anxious father asked me to go at once as his child was "crazy and in convulsions." On my arrival at the house a few minutes later I found a small, delicate-looking child of nearly three years in a convulsion. Her arms and legs were extended and rigid, eyeballs protruded and rolling, pupils dilated to their fullest extent, skin dry and burning and covered from the tips of her toes to the ends of her fingers with a diffuse bright red rash. I asked the mother when the rash made its appearance, and she replied that she had not noticed it before. It resembled in appearance a characteristic scarlatina rash, and in the absence of other contradictory symptoms I would have had no hesitation in pronouncing it as such. It was of an equal degree of brightness over the whole surface of the body and disappeared momentarily on pressure. One could not have placed a five-cent piece over any part of the body where the rash was not present. The pulse was 160, weak and compressible, respiration hurried and shallow.

An empty pill box was shown to me which had contained fifteen small sugar-coated pills, which had been prescribed for a man who was suffering from night sweats. With this and the decided symp-

toms which were present I had no doubt that I had a case of atropine poisoning to deal with.

The child was delirious and unable to swallow, so I at once administered $\frac{1}{25}$ grain of apormorphine hypodermically, and by means of this agent and tickling the fauces with a feather produced free emesis in a few minutes. I then administered $\frac{1}{8}$ grain of morphine hypodermically and watched results for one hour. The convulsive seizures ceased by that time, but the child continued delirious, moaning and tearing at her clothes. Two hours after the administration of the morphine I injected $\frac{1}{16}$ grain hydrochlorate of pilocarpine. From that time the child gradually improved, the delirium passed away, the skin began to act and the pulse, which had been running at 160 per minute, came down to 95.

The poison was taken at 4 p.m., or one hour before I was called. At 10 p.m. the pupils had partly contracted, the redness of the skin had disappeared from the legs and arms and there was only slight remains of it visible on the trunk. Before leaving the house I catheterized the child, who had not voided urine since the morning.

On making my visit the following morning I found the child running around the house. Her pupils were slightly dilated and responded feebly to light. All signs of the rash had disappeared, and to all appearance the child was none the worse for her experience.

On enquiry of the druggist who had supplied the pills I found that each pill contained $\frac{1}{120}$ grain of atropine sulphate, so that in all $\frac{1}{8}$ grain of the alkaloid had been taken by the child.

# RETROSPECT
## OF
# CURRENT LITERATURE.

## Medicine.

### Cyclical Albuminuria.

K. Osswald. "Cyklische Albuminuria und Nephritis (Klinik Riegel)."
—*Zeitschrift für Klin. Medecin.* Band XXVI. Hft. 1 and 2 ;
*Centralblatt für Innere Medicin.* No. 24. 1895.

The term cyclical albuminuria was first used by Pavy (1885) to designate cases of recurring albuminuria.

Osswald has observed seven such cases over lengthened periods and arrived at the conclusion that they were not of a functional character, but due to actual changes in the kidneys. This opinion is, however, not substantiated by any post-mortem evidence, as all the cases eventually recovered. It is founded on the presence of the general symptoms and the character of the urine. In all the cases reported, with one exception, the urine contained hyaline, fatty, and epithelial casts. The general symptoms present were anæmia, drowsiness, headache, palpitation of the heart, vertigo, epistaxis, gastro-intestinal catarrh, &c.

It was noticed that after rest in the horizontal position, the albumen disappeared from the urine, while active exercise had a marked effect in increasing the quantity.

It is pointed out that the early morning urine may be free from albumen, while that passed during the day may contain it in considerable quantities. For the detection of small quantities of albumen he recommends acetic acid and ferro-cyanide of potassium.

### Tabes Dorsalis.

Déjerine. "The course of tabes dorsalis when complicated with optic nerve atrophy."—*La Med. Moderne,* March 20.

It is a well recognized fact that the course of tabes differs markedly in those cases where optic atrophy is present, as compared with the course of these cases where there is no atrophy of the disc. In the latter

the course is steadily progressive, ataxia supervening and increasing usually to such a degree as to render the patient helpless.

In cases where degeneration of the optic nerve takes place, it is uncommon to meet with marked ataxia or severe lightning pains, and both of these symptoms commonly lessen or entirely disappear when the atrophy has reached an extreme degree.

Déjerine recognizes three clinical types of tabes associated with optic nerve atrophy.

1. In the majority of such cases the optic atrophy supervenes at a period, longer or shorter, after the onset of the lightning pains, and locomotor ataxia never appears. As the optic nerve atrophy increases, the pains diminish.

2. In the second type, the blindness appears simultaneously with, instead of after, the lightning pains, and the tabetic symptoms develop with the blindness, but are arrested when the latter is complete.

3. In a few cases, the symptoms are almost entirely confined to the eye, the loss of the knee jerk being the only evidence that we may have, that the degenerative process has a wide range. Gowers says that lightning pains appear if these cases are sufficiently long observed.

According to Déjerine, the special features of tabetic optic nerve atrophy are : (1) It attacks the eyes successively ; (2) it is rapid in its course, being usually complete within a year or eighteen months ; (3) pupils are irregular in size, sometimes the condition is one of myosis, at other times of mydriasis ; and again one may be contracted and the other dilated ; (4) though due to syphilis, anti-syphlilitic treatment is of no value in arresting the atrophy.

The numerous forms of sensory disturbances met with in ordinary cases of tabes, are absent when optic nerve atrophy is present. No satisfactory explanation is forthcoming of the antagonistic action of optic nerve atrophy on the tabes. All that we can say is that in the one case the brunt of the disease falls upon the spinal cord and in the other on the cerebrum.

## The Serum Treatment of Diphtheria.

ADOLF BAGINSKY. " Zur serumtherapie der diphtherie im Kaiser und Kaiserin Friedrich Kinderkrankenhaus in Berlin."—*Berliner Klin. Wochenschrift*, Sept. 16, 1895.

In May last Baginsky published the results of the treatment of 525 cases of diphtheria by means of serum, the mortality being 15.6 per cent., as compared with 41.1 per cent. in cases treated by various means previous to the introduction of the antitoxin.

In the present communication, the results of the serum treatment

all cases of true diphtheria admitted from the 15th March to 31st of August, 224 in number, show that 203 left the hospital well, while 31 died, giving a mortality of 9.37 per cent.

Baginsky naturally concludes that the serum is a powerful agent for good in diphtheria. He is thoroughly convinced that its alleged untoward action has been much exaggerated. In a few cases of older children it was noticed that where the treatment was late in being employed, and where there was a tendency to septic infection, death followed from heart paralysis.

The cause of death in the twenty-one cases was as follows :

From Sepsis..................................................in 2 cases.
"   Sepsis and Heart Paralysis ......................in 7  "
"   Heart Paralysis...................................in 3  "
"   Descending Croup ...............................in 4  "
"   Pneumonia........................................in 2  "
"   Cholera Infantum.................................in 2  "
"   Sudden Collapse...................................in 1 case.

Baginsky's results are very encouraging and should be the means of stimulating those who have the opportunities of treating cases of diphtheria in giving the method a thorough trial.

There surely now can be no question that the serum treatment of diphtheria has established itself as the most valuable of all our agencies used to combat this dread disease.     *James Stewart.*

### Thyroidin and Thyroidismus.

BECKER.  " Beitrag zur thyreoidin-wirkung."

OTTO LANZ.  " Ueber thyreodismus."—*Deutsche Medicinische Wochenschrift*, Sept. 12, 1895.

A review of these two articles serves to present some of the recent theories concerning the effects of the active principle of the thyroid gland, as well as to suggest the necessity of close observation and care in the administration of this agent.

Dr. Becker, of Gensingen, under the above heading records an interesting observation made with this drug and draws therefrom conclusions which need time and experiment to establish fully.

The recommendation of the use of thyroidin has always been made with caution in order to avoid the untoward results often following too full doses. Enumerated they are loss of appetite, sleeplessness, tremors, high state of nervousness, glycosuria, albuminuria and cardiac disturbance, sometimes leading to death. From such results in man, as well as from similar results obtained in experiments on animals the French authorities have lately concluded that the extract of thyroid gland is a dangerous poison and especially a cardiac poison.

To combat this idea Becker recalls the observations of Leichten-

stern who, by the careful administration of this agent in 162 cases, saw no permanent ill effects, and those which did occur were transitory, relieved with setting aside of the drug. He (Leichtenstern) claims that the cause of these symptoms, termed "thyroidismus," does not lie in the agent itself, but that by means of its influence on metabolism products are formed inducing the condition, and this view seems favoured by reason of the frequency of this thyroidism in proportion to the activity of this drug in the system. Now Becker strengthens this view materially, we think, by his observations, which may be briefly reviewed.

A child aged 2½ years, when alone one day, took about ninety tablets of thyroidin, each containing 0.3 grammes. They were supplied by a firm from which a reliable and active preparation of the thyroid gland was obtained, and thus they were not regarded as inert. None were passed undissolved with the stools. The child was carefully watched from the day of taking tablets, July 24th, and was weighed from time to time until August 30th. In body weight, in pulse, in respirations and in urine no changes were observed. The author classes this along with those cases which do not react to thyroid extract. In some cases of obesity this treatment proves ineffectual, and it is noteworthy that in such cases toxic manifestations or thyroidismus are conspicuously absent.

Dr. Otto Lanz, of Berne, gives a lengthy account of numerous experiments on animals and men with different preparations of thyroid gland. Into the details of this article we need not enter. Suffice it to say respecting the experiments from which he draws his conclusions that they were performed on mice, guineapigs, dogs, rabbits, cats and men, with different preparations of the gland, administered by the mouth, and in a few instances by injection subcutaneously.

He sums up his results in the following words:

1. Thyroidismus has its origin in two factors: (a) The poisonous effects following consumption of decomposed glandular elements. (b) The specific action of the gland itself, i.e., thyroidismus in the true sense.

2. Thyroidismus manifests itself in a variable intensity, according to the glandular preparation and the animal subjected thereto.

3. The toxic principle which is active in thyroidismus seems to be capable of producing its effects upon the young, in utero, or when at the breast.

Further, the author suggests the term hyperthyrosis as a more suitable term for the condition now designated by thyroidismus.

Rickets and obesity bear a direct relation to the function of the thyroid gland and are regarded as manifestations of what the author speaks of under the term hypothyrosis.                 W. F. Hamilton.

## Operative Treatment of Intestinal Perforation in Typhoid.

THOMPSON, J. E. "Operative treatment of intestinal perforation resulting from typhoid fever."—*The Medical Chronicle*, Sept., 1895.

In a very interesting article, interesting alike to the physician and surgeon, the writer discusses the operative treatment of intestinal perforation in typhoid fever. The subject, he says has occupied his attention during the last few years, owing to the fact that he had operated on two cases, in neither of which was the diagnosis suspected beforehand. In the first, an engineer on a ship, symptoms of peritonitis set in suddenly after a very indefinite history of previous illness. Operative interference was decided on as offering the only chance of recovery. After some difficulty the cause of the peritonitis, a perforation in the ileum twelve inches above the ileo-cæcal valve, was found and sutured. The patient died twelve hours afterwards, and the post-mortem revealed the characteristic lesions of typhoid. In the second, a somewhat similar case, the patient only lived eight hours.

"In typhoid fever, perforation," says the writer, "although easily diagnosed in the majority of cases, may be attended by so few symptoms that we may completely overlook it. When the signal symptoms, intense sudden abdominal pain, fall of temperature, collapse, and quick onset of tympanites, followed by other evidences of peritonitis, are present we cannot fail to make a diagnosis."

The passage of gas into the peritoneal cavity may occur quickly or slowly. When it leaks quickly through the rent liver dulness may be obliterated in a few hours. If it leaks out slowly the liver dulness may persist, tympany may be ill-defined, and the ensuing peritonitis may be comparatively localized. Obliteration of the liver dulness he considers as anything but an absolute sign.

Is the operation justifiable ? The writer's answer is an unhesitating Yes, if there seem to be the slightest chance of recovery. Spontaneous recovery does in rare cases follow perforation, but such should be regarded as mere pathological curiosities, and should in no way guide us in determining a line of treatment. Spontaneous recovery may similarly follow acute perforative appendicitis, but no surgeon would decline to interfere because nature had so far indicated a method of self-cure. If there is the slightest chance of recovery no surgeon has a right to refuse to give his patient a ray of hope. No thought of good statistics should enter a conscientious man's mind at such a juncture, but he should straightway proceed to the only course at his disposal, viz., removal of the extravasated material."

The writer presents an analysis of twenty-three cases reported up to the present. Of these there have been only four recoveries. Three of these he thinks doubtful, leaving so far only one unequivocal case of recovery, Van Hook's *(Med. News*, Vol. LIX., p. 591), on record.

*A. D Blackader.*

# Surgery.

## Orchidomeningitis Calcificans.

ROSWELL PARK. "Calcification of the tunica vaginalis as a complication of old hydrocele."—*Journal Cutaneous and Genito-Urinary Diseases*, September, 1895.

Dr. Park begins his paper by briefly relating the clinical history of a man aged 63, who had a tumour of one testicle, which on examination was found to be large, firm and unyielding. It had been of the same size for six or eight years, and had existed in a smaller shape for a much longer time. The man, in fact, was a monomaniac, the whole subject of his thought and worry being this enlargement of the testicle. The man urged its removal, and did not wish to take an anæsthetic.

Dr. Park removed the testicle in the usual way without an anæsthetic, the man giving little or no indication of pain. After the operation there was a rapid and complete restoration to both mental and physical health. The tumour was the size of a small ostrich egg. The walls were everywhere tough and gave one the sensation of an egg-shell. Inside of the cavity there were some eight ounces of fluid, which had evidently at one time been pus. Whether the man had ever been tapped previously, or what the occasion for suppuration, was not determined. The inner surface of the membrane was lined with the ordinary pyophylactic membrane and was rough and irregular. On one side and in its proper place were the remains of the testicle, whose walls were much thickened, but not calcareous. In this there were no evidences of destructive disease. The epididymus was also much thickened, especially in its surfaces, but otherwise did not seem materially diseased.

At the lower end of the enlarged sac wall were found two cysts or encapsulated collections containing cheesy material consisting mostly of cholesterin crystals and fat.

One sees such changes most often in the pericardium and pleura, but no serous membrane of the body seems absolutely exempt.

Sir Astley Cooper was one of the first writers to call attention to this condition, which he did in his *Observations on the Structure and Disease of the Testis* in 1845. After speaking of this change taking place in other tissues he goes on to say:

"The tunica vaginalis occasionally undergoes this change, and a

portion of that membrane thus diseased was given me by Mr. Warner, surgeon of Guy's Hospital, forty years ago. He operated on a person who had long had a hydrocele. He found his knife resisted by earthy matter in one part of the tunic, but he succeeded in removing it. I dried the portion which he removed and found several deposits of earth in it. I showed it in an evening's lecture on surgery to Mr. Hunter, who, after examining it, laughingly said, 'I thank you, sir,' and put it in his pocket."

The tunica albuginea, which is a tendinous structure, is more frequently affected with this complaint than the tunica vaginalis. Many surgeons have reported similar cases.

### Address in Surgery.

JONATHAN HUTCHINSON. British Medical Association; Sixty-third Annual Meeting, held in London, July 30th, 31st, August 1st, 2nd and 3rd.—*British Medical Journal;* August 3rd, 1895.

In this address Mr. Hutchinson reviews in his wonderfully clear style the past one hundred years of surgical progress. The history of ovariotomy and the use of the clamp is particularly interesting.

In speaking of lithotomy and litholopaxy Mr. Hutchinson showed a spirit worthy of emulation, and it cannot be better expressed than in his own words: " When, however, Bigelow taught us how to complete the operation at one sitting and to remove all the fragments, I saw almost with regret that lithotomy must henceforth give place. My fingers, however, needed practice in the new operation, and I found to my chagrin that I could not do it so quickly and neatly as those who made it a special pursuit. One patient unfortunately died and I felt sorry that I had not cut him. I determined that I would not do litholapaxy *propriâ manu* again, but that I would watch the results in the hands of a specialist friend. From that date onwards I have always on discovering the presence of a stone of a size not demanding lithotomy transferred the patient to my friend. The result has been that during a long series of years we have had not a single death, and what is almost of equal importance, not a single case needing a second operation."

Mr. Hutchinson then spoke of the great increase of operative surgery and the vastly improved prognosis in operations for malignant disease, due to our ability to make an early and positive diagnosis and to our improved methods of operating.

For example, Mr. Hutchinson thinks that " No one ought now to die of cancer of the tongue, for nothing except neglect of the early stage can bring about such a result. It is the doctrine of 'local origin

of cancer,' of a 'precancerous stage,' which has p?  ?, us in this position. In former days no operations were, with the rarest exceptions, performed for this disease; and if they were it was in the late stage when, to use the forcible expression of Mr. Sharp 'the procedure was both dreadful in the doing and melancholy in the event.' Cancer of the tongue was hardly ever diagnosed until it was too late to operate. One of our most popular surgical manuals taught that enlargement of the lymphatic glands in the latter afforded one of the best means of distinguishing between syphilitic and cancerous disease. We should now regard it as evidence of almost culpable delay, and as implying that the case had advanced too far for surgical aid. What hinders that all cases of cancer of the tongue should be submitted to operation in the earliest stage? Nothing except defective diagnostic capacity on the part of members of our own profession. The fault is but rarely on the part of the patient. I never yet met with a patient to whom it was kindly yet confidently told 'You have got cancer,' who did not gladly and without delay assent to what was recommended."

A similar hopeful view is taken concerning cancer of the breast:

"There was never anything formidable in the performance of an excision of the breast, but no case was ever operated upon until the diagnosis was as clear as daylight and until, in but too many instances, the disease was far advanced. The class of symptoms by which our text-books taught us as students to recognize cancer of the breast were for the most part as in the case of the tongue, those present only in the late stage. Now we rely upon an entirely different set of symptoms. We now trust solely to the trained finger to recognize the character of the induration, and we lay down an inexorable precept that if there be any reasonable doubt the breast should be removed. Our patients, as a rule, accede without much reluctance to our recommendations, for they know from general report that the modern operation is a mere trifle. The result of this change of practice is that the statistics of cancer of the breast must be rewritten. Those collected three or four decades ago are not in the least applicable to our present results. Permanent recoveries after removal of the breast for scirrhus, as after those of part of the tongue for epithelioma, are now common in the practice of all surgeons."

<div style="text-align: right">G. E. Armstrong.</div>

# Midwifery and Diseases of Women.

## The Pathology and Treatment of Postpartum Hæmorrhage.

BOKELMANN. " Zur Pathologie und Therapie der Nachgeburtsblutun-
gen."—*Monatschrift f. Geburtshülfe und Gynäkologie*, August,
1895.

There is no subject of more practical interest to the obstetrician
than postpartum hæmorrhage, since there is probably no other
emergency which tests more severely his general resource, coolness,
decision and skill. It is impossible to treat hæmorrhage rationally
and effectively without having clear ideas respecting its cause ; but,
unfortunately, opinions are divided regarding its pathology and treat-
ment and no definite line of practice has been agreed upon. As a
result of this confusion of ideas, notwithstanding modern improve-
ments in technique, death still occurs from postpartum hæmorrhage
more frequently than it ought to do, and many lives are lost which
might have been saved by prompt and judicious treatment. On the
Continent, during the past two years, a vigorous controversy has been
going on between Veit, Fehling, Leopold, Dührssen, Fritsch, Schauta,
Heitzmann and others, respecting the causes and treatment of postpar-
tum hæmorrhage, which culminated in a discussion before the Obstetri-
cal and Gynæcological Society of Berlin, in July, 1894. The chief points
in dispute were (1) the relative frequency of *traumatism* and *atony of
the uterus* as causes of hæmorrhage, and (2) the necessity or advisability
of manual separation of the placenta for the arrest of hæmorrhage or
on account of retention. Veit is much impressed with the dangers
attendant upon manual separation and the heedless way in which the
operation is too often done. Olshausen considers it one of the most
dangerous of obstetrical operations, on account of the impossibility of
sterilizing the vagina completely. Veit maintains that the frequency
and importance of atony as a cause of postpartum hæmorrhage is
greatly over-estimated, and believes that fatal hæmorrhage is gener-
ally due to traumatism. He has scarcely ever seen a case of threat-
ening dangerous atony, and does not think that the prognosis of atony
is improved by the manual removal of the placenta. The importance
of a differential diagnosis between atony and trauma necessitates a
distinction between hæmorrhage occurring *before* and *after* the separa-
tion and expulsion of the placenta. In the first case he holds that

bleeding can only occur from traumatism or the separation of the placenta according to Matthews-Duncan's method. Atony can only be held accountable for hæmorrhage when a large retro-placental clot has formed or when bleeding begins after the expulsion of the placenta. As regards treatment, he holds that during the first few hours after a full term labour it is never necessary to pass the hand into the uterus on account of atony, and that the manual separation of the placenta is for the most part a superfluous operation. Handling the genital canal is necessary only in cases of traumatism, and then the proper treatment is to suture immediately. Even in abnormally severe hæmorrhage during the third stage he condemns manual removal of the placenta. The hæmorrhage at that time indicates a partial separation of the placenta, which may be completed by vigorous friction of the fundus. The uterus is thereby stimulated to contract and retract, thus peeling off the placenta and stopping hæmorrhage by closing the mouths of the bleeding vessels. If the placenta remain adherent for a long time he does not admit that the cause is to be found in the existence of true adhesions between the placenta and uterine wall, which require to be broken up artificially. The tough bands of adhesions so often described in such cases as making the separation of the placenta so difficult are not considered by Veit to be true adhesions at all, but only show that the placenta is being detached through the placental tissue and not through the decidual layer, as it ought to be. He thinks that atony is the cause of placental retention, and that repeated frictions would succeed in time in stimulating the uterine muscle to activity, and the placenta would be separated then naturally and completely. He does not believe in the immediate removal of retained bits of placenta or membranes, but prefers waiting for the appearance of hæmorrhage or other symptoms subsequently. In the majority of cases the uterus separates and casts off these retained fragments without trouble. He condemns bimanual compression of the uterus through the vagina and abdominal wall and considers Dührssen's intra-uterine tampon uncertain and not free from danger. He is an advocate of the hot vaginal and intra-uterine douche. In short his treatment of postpartum hæmorrhage consists in vigorous and, if necessary, long-continued frictions and kneading of the fundus, together with hot douching in certain conditions; in traumatism, immediate suture. Ergot is also of great value in some cases. Finally he lays great stress upon prophylaxis, which consists in the proper management of the third stage of labour, carefully watching for and guarding against deficient uterine action.

Fehling energetically combats Veit's opinions and practice, claiming

that hæmorrhage from atony is six times as frequent as from trauma, and denying that hæmorrhage before the expulsion of the placenta is always due to the Matthews-Duncan method of separation, if trauma can be excluded. Such a sharp distinction cannot be made practically between Schultze's and Duncan's method. He does not think that Veit's rules for practice will always succeed, and moreover they may lead to bad results. He does not see why it is allowable to introduce the hand into the parturient canal and freely handle the cervix and vagina exploring the cellular tissue of the parametrium while searching for and suturing traumatisms, while it is forbidden to separate the placenta by hand for fear of septic infection. In five years he has had occasion to remove the placenta manually in 67 cases ; 70 per cent of these patients recovered without febrile symptoms, and only 2 died, but they were feverish when they came under observation. He denies that the placenta can be removed in every case by kneading and external pressure, and believes that too long waiting may endanger or destroy the woman's life. He considers the most dangerous part of Veit's practice to be his leaving retained bits of placenta *in utero* till the onset of hæmorrhage or other symptoms subsequently. He strongly urges the removal of such retained pieces at once, for as long as they are *in utero* one never knows when a severe hæmorrhage may occur ; moreover, the conditions are less favourable if they have to be removed later. In the discussion before the Berlin Obstetrical Society, opinions were divided as to the relative frequency of atony and trauma as causes of hæmorrhage, but all agreed that the tendency has been to overestimate the frequency of atonic hæmorrhage. Dührssen laid stress upon the importance of avoiding or minimising large loss of blood in the newly delivered, on account of the obstinate anæmia and debility which are apt to result. All the speakers dwelt upon the necessity of carefully disinfecting the *genital tract* as well as the operator's *hands* before attempting to separate the placenta manually. Dührssen said that the patient would run less risk from the hæmorrhage than from the introduction into the uterus of an infected hand, but he also pointed out that a non-disinfected hand is not necessarily an infecting hand. The general consensus of opinion was against Veit's practice of leaving retained bits of placenta *in utero*. As the result of this discussion Veit modifies his views considerably, and it was finally pretty well agreed that the manual separation of the placenta is justifiable when other measures have failed, but that the operation should not be done hastily or without careful disinfection.

The discussion is sure to have a good effect, and Veit has done good

service by calling attention to the reckless way in which the manual separation of the placenta has been undertaken of late years, and by pointing out the risks of the operation and the success which follows a more conservative treatment. Unquestionably hæmorrhage and retention of the placenta would be far less common if obstetricians would take more pains in the management of the third stage of labor. Before resorting to the manual separation of the placenta for hæmorrhage during the third stage, Fritsch's method should be given a fair trial. With one hand the vulva is seized between the thumb and four fingers in such a way as to close it completely. The other hand grasping the fundus upon the upper and posterior surface, presses the uterus forcibly down into the pelvis. Thus the whole external and internal genital organs are held between the two hands, and combined pressure is exerted upward and downward. The uterine muscle is stimulated to contract and internal hæmorrhage is controlled, while the genital canal from cervix to vulva is also forcibly compressed and bleeding from fissures and tears is checked. A pad of absorbent cotton, the size of the fist, may be laid upon the vulva to give the external compressing hand greater purchase. By this method severe hæmorrhages may be controlled without risk of infection from the operator's hands, even though the source of bleeding has not been made out ; it is therefore a useful manœuvre in sudden hæmorrhage occurring in anæmic delicate women.

*J. C. Cameron.*

# Pharmacology and Therapeutics.

## Diseases of the Heart.

BRAMWELL, BYRON. "The treatment of the diseases of the heart."—
*Edinburgh Medical Journal*, May, 1895.

BALFOUR, G. W. "Cardiac therapeutics."—*Edinburgh Medical Jour-
nal*, June, 1895.

In these two very interesting papers the discussion on cardiac
therapeutics before the Medico-Chirurgical Society of Edinburgh,
which was opened by Dr. Fraser's paper (*Mont. Med. Jour.*, July, 1895,
p. 34), is renewed. Dr. Bramwell devotes his paper to a consideration
of the general principles which should underlie the treatment of heart
cases. The first essential is a correct diagnosis which involves an
opinion as to (1) the nature, severity and extent of the lesion, and
whether progressive or stationary; (2) the condition of the cardiac
muscle; (3) the condition of the arteries; (4) the conditions of
tissues and organs as a whole; (5) the special peculiarities and sur-
roundings of the individual. Especially is the condition of the
cardiac muscle the key to cardiac therapeutics, but its exact deter-
mination is often very difficult. In trying to arrive at it, we must
study (1) the size of the heart; (2) whether hypertrophy or dilatation
is predominant; (3) the way in which the heart is acting and con-
tracting, whether forcibly, irregularly, and the like; (4) the condition
of the peripheral arterial, venous, and capillary circulation; (5) the
way in which the circulation is carried on as indicated by absence
or presence of dyspnœa, palpitations, cardiac pain, &c., during rest
and under strain; (6) the way in which the heart muscle responds
to tonic remedies.

In many forms of cardiac disease, Dr. Bramwell considers rest as
the most important means of treatment at our command. It is indi-
cated in acute endocarditis; in all cases in which myocarditis is
suspected; in myocardial degeneration (fatty and fibroid); in pul-
monary lesions with an engorged condition of the right heart; in
valvular lesions with decided breakdown of compensation; in cases
of angina pectoris in which there is reason to suspect organic disease;
and in all severe cases of senile degeneration of the heart.

Exercise, on the other hand, is a very valuable means of treatment
in many cardiac conditions. Especially in neurotic affections, in fatty

infiltration, in gouty conditions where there are no marked degenerative changes, and in many valvular lesions so long as the myocardium is fairly healthy, and in some conditions of dilatation, associated with fatty infiltration, or the result of such conditions as excessive beer drinking, but in which we have no marked degree of myocardial degeneration. In many cases of aortic and mitral disease, in the less severe forms of senile heart and of myocardial degeneration, moderate, and judiciously regulated walking is invaluable, so long as the compensation is well maintained. By exercise, we promote the general health, and stimulate the peripheral circulation, preventing stasis and engorgement.

Dr. Bramwell also attaches much importance to sustaining the mental tone of the patient. In many cardiac cases there is, he says, no tonic more efficacious than a favourable opinion confidently expressed.

So long as compensation is well maintained the most powerful cardiac tonics, such as digitalis and strophanthus, are unnecessary and may be harmful. In temporary breakdowns of compensation, the enfeebled right heart may be aided by digitalis, strophanthus, strychnine, alcohol, etc. and, if greatly engorged, the strain may be relieved by venesection.

After breakdown of compensation, the treatment in cardiac cases of all kinds has to be guided by the opinion as to the nature of the lesion and the condition of the heart muscle.

Dr. Bramwell, towards the close of his paper, refers to some individual lesions and their appropriate treatment.

Fatty degeneration, due to deficiency of hæmoglobin, as the result of anæmia, demands treatment with iron or arsenic; when due to pernicious anæmia there is no remedy like arsenic. In fatty degeneration due to disease of the coronary arteries, arsenic and strychnine, alone or in combination, are to be preferred to digitalis or strophanthus. In cases of fatty infiltration and flabby heart, careful regulation of the bowels, fresh air, and carefully regulated exercise, together with arsenic and strychnine, are the best measures to employ.

In cases of senile, debilitated and fatty hearts, and in cases of mitral regurgitation with high blood pressure and constricted vessels, careful regulation of the diet, distilled water, salicylate of soda, and arsenic and strychnine may be employed. Iodide of potassium is often advantageous. Where a cardiac tonic is required, strophanthus is probably preferable to digitalis, as Prof. Fraser claims that it acts without constricting the peripheral arteries.

In cases of chronic myocarditis and fibroid degeneration rest is

essential. Digitalis, arsenic, strychnine and iodide of potassium may all do good.

In cases of advanced valvular disease with defective compensation, large doses of digitalis or strophanthus should be employed.

In angina pectoris, with high blood tension, nitroglycerine or amyl nitrite are effective, but in cases of advanced cardiac degeneration, or free aortic regurgitation, with a soft pulse, they are useless, or even dangerous. Here diffusible stimulants and morphia injections are the most efficient remedies.

As to the mechanical removal of dropsical effusions, beneficial effects may be obtained by repeated tappings in some cases of ascites due to organic cardiac disease. In cases of hydrothorax the results have, as a rule, been merely temporary and often unsatisfactory. He rarely resorts to puncturing the legs or the scrotum until other measures have failed to remove or lessen the oedema. In his experience draining the subcutaneous tissues has rarely been attended with marked or lasting benefit. Massage he thinks a more useful remedy than tapping in many cases; it aids the venous and lymphatic return, and quickens the circulation in the muscular and peripheral tissues of the body. It is also of use in many cases in which, owing to the nature of the lesion, ordinary muscular exercise is contra-indicated. Vene-section is undoubtedly, he says, valuable in many cases in which the right heart is greatly distended and engorged, and it is particularly useful where the engorgement depends upon temporary lung compli-cations superadded to mitral disease. Dry cupping is very useful for the relief of congestion of the lungs and other pulmonary and kidney complications.

With regard to the soporifics, the most useful are chloralamide, paraldehyde and morphine. In cardiac cases sulphonal is much less certain in its action than chloralamide, and in grave cardiac affections he has almost entirely given up the use of chloral hydrate, on account of the marked depression which it is apt to produce. Paraldehyde is especially useful in those cases where there is bronchitis, and in which morphine is contra-indicated. After the breakdown of compensation, and in the ultimate restlessness in cardiac cases, small and frequently repeated doses of morphine are often invaluable. It is also of much service in some cases of angina pectoris where nitrite of amyl fails to give relief or is contra-indicated; for example, where the blood pres-sure is low and where there is free aortic regurgitation. Morphine should never be given where there is oedema of the lungs or much bronchial secretion, for disastrous results have followed its adminis-tration under those circumstances.

Dr. Balfour thinks that the prominent symptom complained of is often a guide to the nature of the case and an indication for treatment, but the physician must endeavour to understand what the symptom means, and its connection with other phenomena present. He considers it impossible to ascertain during life whether the coronaries are atheromatous or not, or whether the heart is fatty or not. Where cardiac compensation is incomplete, rest is paramount. Excessive exercise tends to promote irremediable failure of the heart. Diet is of extreme importance.

Drugs of use in cardiac cases are not numerous, but are very valuable. Strychnine is of much value where the cardiac energy is defective, and its use may be continued a long time. Five minims of the solution of strychnine every twelve hours is about the largest safe dose for continuous administration.

Digitalis is of paramount importance, improving the nutrition of the myocardium, contracting dilated ventricles and removing dropsy. One grain of powdered leaves every twelve or twenty-four hours is usually sufficient. Larger doses may be given in cases of flabby dilated hearts, but require watching. Nitrites and iodide of potassium may be used to lower blood pressure and allow digitalis to act beneficially where it might otherwise do harm.

### Action of Nitrate of Silver.

TWEEDY. "A case of argyria, with a note on the therapeutic value of silver nitrate."—*The Dublin Journal of Medical Science,* July, 1895.

The writer gives details of a case of locomotor ataxia, which first came under his observation in 1871. The patient was then suffering from a well-marked type of the disease, and among other symptoms complained of pronounced girdle and lightning pains, manifested the characteristic gait, and was unable to stand erect with closed eyes. He was ordered $\frac{1}{3}$ gr. of nitrate of silver three times daily in a pill. The pills were continued, with short interruptions, during his stay of six weeks in the hospital, and afterwards with tolerable regularity for two years. On his reappearance in the hospital in 1873, there was marked improvement in all his symptoms, so the drug was taken at intervals till 1876. At this time there was some return of the ataxic symptoms and iodide of potassium was prescribed, but with little success, and the patient fell back on the silver nitrate. He was then lost sight of for six years, when he turned up in Steeven's Hospital, suffering with an eczema of the legs. All the ataxic symptoms had now

disappeared, but he occasionally suffered from lightning pains, accompanied by sickness of the stomach, and on each occasion obtained relief from a course of the silver pills.   General argyria had now distinctly manifested itself.   At the close of 1894 he came once again to show himself to Dr. Tweedy.   Except for the inevitable signs of old age his health was good.   It was then more than ten years since he had shown any definite symptoms of ataxia, and Dr. Tweedy considered that the discoloration of his skin had not been an extravagant price to pay for the benefits he had derived from the use of the drug.

After referring to other recent cases of argyria, Dr. Tweedy says that all these cases serve to emphasize the fact that silver salts, if introduced into the body, are eliminated from it to a very slight extent, if at all.   He quotes the following conclusions arrived at by Fraschetti[1] in regard to argyria:

1. All silver preparations give rise to argyria ; a local deposit may even occur after their external employment.

2. Reduction of the silver salts administered takes place in the stomach, and afterwards in the intestinal canal, tending to the separation of the metal.

3. Silver finds its way into the organs through the lymphatics.

4. It is not eliminated by the urinary organs or by the intestines.

5. It does not as a rule produce any material effect upon the health.

The quantity of silver requisite to produce argyria must be subject to considerable variation.   Krahmer[2] says the smallest quantity that has produced it is 450 grains, but in Riemer's case 1,740 grains had been taken before any staining of the skin appeared.   An acute form of the disease has been recently described by Olshausen,[3] who relates a case in which a large open wound had been treated with a one per cent. solution, when the mucous membrane of the cheeks, gums and under surface of the tongue became stained of a blue-black colour, and eight days later the patient died of exhaustion from diarrhoea.

Dr. Tweedy concludes that while no precautions can guard against the staining that follows the prolonged use of nitrate of silver, yet the general health is not in the least affected.

[1] *Deutsche Med. Zeit.*, Aug. 22, 1892.
[2] *Das Silber als Arznei Mittel*, Halle, 1845, p. 153.
[3] *Deut. Med. Woch.*, 1893, No. 47.

## The Treatment of Whooping-Cough.

S. Russell Wells and L. Gerard Carré. "The therapeutical
value of cocaine in whooping-cough."—*The Lancet*, June 8, 1895.

Fischer. "The value of quinine in whooping-cough."—*New York
Medical Journal*, May 11, 1895.

Johnston, W. W. "On whooping cough, its great fatality, and the
necessity for isolation and rest in its treatment."—*Archives of
Pediatrics*, April, 1895.

There are few diseases for which more diverse methods of treatment
or a larger number of remedies have been recommended than for per-
tussis, notwithstanding which, it must be confessed, our success
is still very often problematical. The value of quinine, both when
administered internally and applied locally, has been recognized by the
profession for some time past. Administered as a dry powder by the
mouth we have employed it now for many years and are satisfied of
its value. Dr. Fischer writes enthusiastically of his success with it,
and although we would ourselves speak more reservedly of our suc-
cess with it than he does, yet we cordially agree with him in recom-
mending it as a valuable remedy which, given in sufficient doses (one
to six grains in powder three times a day), exercises apparently a
specific influence in the mouth and pharynx, diminishes the number
and violence of the attacks, and apparently shortens the course of the
disease. It appears also to influence very favourably any bronchitis
or pneumonia which may complicate an attack. Dr. Fischer recom-
mends it to be given in solution with a little hydrochloric acid. In
our hands we have found it much more readily taken when given as
a powder dry on the tongue, associated with powdered extract of
liquorice, and swallowed with a little coffee or milk.

Drs. Wells and Carré claim excellent results from the internal use
of small doses of cocaine. Their experience in the out-patient depart-
ment of the Great Ormond Street Hospital for Sick Children has been
a large one. These writers consider that this affection is due to a
microbe, not as yet certainly determined, which has a local habitat in
the respiratory mucous membrane, and think that the catarrhal stage
should be regarded as the period of microbic activity, and the whoop-
ing stage as due to the after-effects of a poison generated by the
microbe. The best method of treatment would consequently be the
exhibition, during the early stage, of some drug which would destroy
the microbe and counteract the effect of the poison. This, they think,

is for the present impracticable, owing to imperfect knowledge on our part, so they look for a drug to antagonize the effect of the poison in its later stages. This drug should stimulate nerves antagonistic in action to those involved, and lessen the sensibility of the peripheral terminations of the nerves passing from the respiratory and gastric mucous membranes to the medulla. Such a drug they think they find in hydrochlorate of cocaine, which they recommend, not to be applied locally, but to be given internally in doses based on the standard of one grain for an adult three or four times a day. In this way they have treated 323 cases in the out-patient department of the Great Ormond Street Hospital for Sick Children. The cases came under observation during the most unfavourable months of the year, namely, the late autumn and early winter of 1894, when one would expect the course of the disease to be as long or as unfavourable as it ever is. Under this treatment the average duration of the disease was only three weeks, although severe cases were more protracted. The child, as a rule, after commencing treatment showed marked improvement in its general condition ; vomiting was arrested, anorexia disappeared, the cough became less frequent, and sleep improved. No marked evil effects have been noticed by the writers to follow the use of the drug. Slight relaxation of the bowels appeared in some cases, but this they did not regard as having an untoward effect on the course of the disease. In most cases the children were kept under observation long after the symptoms of pertussis had ceased, so as to enable the observers to speak with certainty of the permanency of the cure.

Dr. Johnston directs attention to the great fatality of this disease, as shown by the mortality records of England, Germany and the larger cities of the United States, in all of which it takes rank as second only to scarlet fever as a cause of death in children. While regarding it as a specific disease due to a micro-organism, he thinks that in the effort to cure the disease by internal and local specific remedies, the most important indications of treatment have been overlooked. These are the feeble and dilated heart due to mechanical overstrain, and the resulting disturbed state of the circulation in the brain and lungs favouring cerebral and pulmonary congestion. Specific methods of treatment have thus far been unsuccessful in aborting or even modifying the character of the attack, and, until they prove more efficacious, an important principle of treatment should be to give the heart assistance by relieving it of unnecessary work. Rest, therefore, becomes a cardinal point in treatment, and he strongly pleads that the child should be kept in one room, and at rest in bed, in all cases where the paroxysms are severe or frequent. Free ventilation

and fresh air should be secured as far as possible in the sick room, but the outdoor fresh air methods of treating cases he considers unscientific; increasing risks both for the patient and the public. This seclusion and rest should be absolute so long as the paroxysmal cough is, by its frequency or severity, a source of danger.

He claims for this simple procedure a distinct amelioration of the several stages of the disease, while the danger of infection for others is reduced to a minimum.

*A. D. Blackader.*

# Pathology.

## On Abdominal Incision in Peritoneal Tuberculosis.

JORDAN. " Ueber den Heilungsvorgang bei der peritonitis tuber-
culosa nach Laparatomie."—*Beitr. f. Klin. Chirurgie.* XIII.,
part 3. 1895.

STCHÉGOLEFF. " Recherches expérimentales sur l'influence de la
laparatomie sur le péritonite tuberculeuse."—*Archives de Méd.
Experiment. et de l'Anat. Pathol.* 1894. P. 649.

Not a little attention has been paid of late to the results of simple
laparatomy in bringing about arrest of tubercular peritonitis. Two of
the more recent papers upon the subject may here be briefly noticed.

Jordan records a case of tuberculosis sicca of the peritoneum arrested
by simple incision. He has collected together altogether fourteen
cases, in which opening of the abdomen has been recorded as having
induced either what may be termed anatomical healing of, or distinct
improvement in, peritoneal tuberculosis. Discussing the numerous
theories that have been advanced to explain the good effects pro-
duced, he concludes that not one is satisfactory ; the riddle remains
unsolved. Yet there is one indication given by a study of the cases
brought together which, it seems to us, points in the direction in
which the solution is to be found. We refer to the fact that the
majority of cases that have been successful afford a history of
repeated abdominal incision. It would appear, therefore, that the
reaction leading to retrogression of the tubercular process is of tem-
porary duration, and that the best results are obtainable by inducing
it frequently. Further, there is an entire absence of proof that the
tubercle bacilli are attenuated or enfeebled by the very slight altera-
tion in their environment set up at the moment of operation. On the
contrary, we may be said to know well that a change of environment
of this extent exerts no perceptible action upon the virulence of the
bacilli. We can therefore go further and state that where laparatomy
is successful in arresting the process, the reaction must be of the
nature of an increased resistence *on the part of the tissues* to the
growth of the tubercle bacilli, and, presumably, to the effects of the
products elaborated in the process of growth. It is beyond this
point that we enter into doubtful territory, although Stchégoleff's
researches open the way a little further.

This observer employed dogs—animals which are susceptible to tuberculosis, and in which small quantities of bacilli obtained from tuberculous patients induce (when inoculated into the abdominal cavity) a peritonitis closely resembling tubercular peritonitis in the human subject. Twelve animals so inoculated and subjected to no other treatment, died of general tuberculosis in from twenty-two to thirty-four days. Ten other dogs, inoculated in a similar manner, underwent abdominal incision at various periods. All of these survived the controls by periods varying from one to three weeks, and four of them gained in weight and showed other evidences of recovery. Of these one was still alive four months after the operation, the other three were killed 52, 70 and 85 days respectively after laparatomy.

In these experiments it is to be noticed that abdominal incision was only performed once in each case, and we would suggest that the incomplete success obtained may in part have been due to this fact. Stchégoleff leaves this possibility out of account and ascribes the deaths that occurred to the fact that the disease had already become too far advanced to be arrested. The dog killed 85 days after the operation showed not a sign of tuberculosis; the mesenteric tubercles seen at the time of abdominal incision had all disappeared; at most here and there fibroid thickenings of the peritoneum were recognizable. A guinea pig inoculated with a portion of the omentum removed at the autopsy remained in perfect health. This dog had been operated upon 12 days after inoculation with the tubercle bacilli. The two other dogs killed at the end of 52 and 70 days respectively had been operated upon 28 days after inoculation. In them he found complete retrogression of the abdominal tuberculosis; there were, however, tubercles in the lungs and liver. Whether the generalization of the process had occurred antecedent to the operation (which is not improbable), or not, must remain an open question.

The anatomical observations of the greatest importance brought out by Stchégoleff is that whereas in the control animals there was not a sign of adhesive inflammation, adhesions were present in all those that had undergone operation. Arrest of the tubercular process therefore, whether partial or complete, was accompanied by inflammation. Associated with this there was found a fibroid condition of the tubercles. What was the immediate cause of the inflammation the author will not venture to state positively. Yet this, we think, may be affirmed with safety, that the inflammatory reaction following upon the opening of the abdomen and exposure of the viscera led coincidently to the modification in the tubercles.

We are too apt to confound inflammation with its cause, and, in con-

sidering this process, to lay stress upon injury and injured state of the tissues which precede and lead up to inflammation, and not sufficient stress upon the attempt at repair, which is the essence of the inflammatory process.    Thus we almost inevitably regard a simple peritonitis such as that following upon laparotomy as an indication of a lowered state of the tissues, whereas truly it is to a large extent the very reverse, and is an indication of the vitality of the tissues and of active response to irritation.    It is interesting to note that in those cases in which the favourable effects of tuberculin and cantharidin have been followed (as in cases of lupus), the most obvious result of the remedies has been the marked local inflammation by them induced.    We may therefore, I think, safely state that where laparotomy is successful in bringing about an arrest of peritoneal tuberculosis, it achieves this result as a consequence of the increased activity or reaction of the tissues—of the cells forming or going to form the tubercle—induced by the simple inflammation set up.    The antagonism between various writers upon the subject hinges, it seems to us, upon this matter of the reaction of the peritoneum and its surroundings to injury, however slight.

*J. G. Adami.*

# Canadian Medical Literature.

## PERIODICALS.

### JULY, 1895.

(1.) The following conclusions are drawn in this paper :—(1.) That seminal vesiculitis is an analogous disease with salpingitis ; (2) that it is of very frequent occurrence ; (3) that it is the so-called cystitis, prostatitis and prostatic abscess that follows gonorrhœa ; (4) that,

with proper treatment, it is a curable disease ; (5) that it is easily recognized *per rectum*.

(2.) A series of experiments undertaken to determine the relation between the possession of motility by bacteria, and their ability to penetrate wet cotton has given the following results :—(1.) Motile bacteria penetrate wet cotton in any direction readily ; the rate of passage varying for different species with the relative activity of their motility ; (2) non-motile bacteria pass *downward* through wet cotton readily ; (3) non-motile forms *may* pass *upward* through wet cotton, but such passage is very slow—from some days to two or three weeks ; (4) aërobic forms which are also motile may utilize their motility to resist gravitation ; so remaining at or near the surface of a liquid medium exposed to oxygen. After giving the details of the methods of investigation, the writer points out that these experiments may be made of practical use in distinguishing certain allied species which differ in the activity of their motion. A " special note " is added on the value of this method for differentiating bacillus typhi abd. and bacillus coli communis, the motility of the former being very active, while that of the latter is very slow.

(3.) The procedure advocated by the writer seemed to be based on the following conclusions :

1. One of the most important functions of the cerebro-spinal fluid is to regulate the tension of the great nerve centres, and hence the blood supply to them.

2. That spinal membranes, and consequently the walls of spina bifida, resemble the peritoneum in being apt on irritation, to form adhesions. This provision safely allows the communication between sac and cord to be closed by a suitable ligature, provided septic germs do not gain admission.

3. Neither the size of the tumour nor the breadth of its skin base has any significance in regard to the communication between the sac and cord. A large sessile spina bifida may have so small and imperfect a communication that the tumours may be drained without materially disturbing the tension of the cord. This accounts for occasional cases by tapping, irritating injections, and other equally unscientific modes of treatment. On the other hand, a small one attached by a pedicle may have such free communication that even to tap it leads to disastrous results. It is quite natural to suppose that the delicate sac of a spinal hernia, when it impinges against the skin, receives sufficient resistance to cause it to extend laterally.

4. That the amount of bone deficiency and implication of nerve-

tissue can be determined, not by the size of the tumour, but by the general condition of the infant and the extent of paralysis in the parts below. The parts of the cord in the sac are functionally destroyed, and removal will not increase the paresis.

5. Spina bifida is frequently accompanied by other congenital deformities, such as talipes, sphincter paresis, hydrocephalus, and paraplegia. The last named is always, and hydrocephalus generally, incompatible with viability. Hence, from the first, quite a number of the cases are beyond the possibility of a cure.

6. That no operation will successfully stand repeated trials by different operators, unless in its performance a provision is made to prevent disturbance of the tension of the cord.

7. The higher the tumour is placed on the spine, the more delicate are the walls of its sac, the greater the irritation to it by the movements of the child, and the more difficult it is, other things being equal, to treat.

The operation is very simple and is easily performed. After the necessary flap is made, the pedicle is tied by silk ligature and all external to it removed. The author concludes his paper by notes on seven cases treated by this method. Four of the patients are alive and well to-day, one made complete recovery, but died later of meningitis, another had hydrocephalus at the time of operation and died in a month, and only one case of death could be attributed to the operation.

(4.) This article is based upon Dr. Shepherd's experience of sixteen cases of bronchocele upon which he had operated. In several cases the tumour reached from the hyoid bone to the clavicle. They were, as a rule, cystic and encapsulated, and full of a dark yellow fluid containing cholesterin, round cells and fat globules ; sometimes, however, when there had been hæmorrhage, the contents were of a dark coffee ground material. The solid tumours were colloid in character. The method employed for their removal is enucleation and is comparatively easy. An incision made over the tumour is carried directly down to the capsule, the cyst is emptied and shelled out. Some cases presented considerable difficulty due to subsidiary cysts on the posterior wall or hæmorrhage due to friability of the cyst wall. The deeper vessels were sometimes troublesome, and on one occasion he had cut the internal jugular. Chloroform is preferred to ether as an anæsthetic in these cases.

*Kenneth Cameron.*

# Reviews and Notices of Books.

## The Dyspepsia of Phthisis; Its Varieties and Treatment.
Including a description of certain forms of Dyspepsia, associated
with the Tubercular Diathesis. By W. Soltau Fenwick, M.D., L.D.,
M.R.C.P. London: H. K. Lewis. 1894.

It must be generally admitted that disorders of indigestion are very
frequently met with in the course of pulmonary tuberculosis, and some-
times appear to even precede the more distinctive symptoms of this
disease. Considering the importance of everything which affects nutri-
tion, the treatment of such digestive disorders becomes one of the most
important duties of the physician. In the present volume we have a
careful study of the various forms under which we meet with this very
troublesome symptom. The opening chapters deal with questions of
pathology and morbid anatomy. The condition of dilatation of the
stomach in the phthisical is first alluded to. The mammillation of the
mucous membrane, the *état mamélonné* of Louis, so characteristic of chronic
catarrh is attributed to the contraction of newly formed fibrous tissue
situated between the secreting tubules, and is analogous to the nodular
appearance of the liver or kidney in cases of chronic interstitial inflam-
mation of these organs. In a certain proportion of these cases, indications
of lardaceous degeneration are present, as shown by the reaction of the
tissues to a solution of iodine. Ulceration of the stomach the writer has
met with, as hæmorrhagic erosions, follicular ulcers, and not infrequently
as the simple chronic ulcer. Occasionally the solitary glands become
enlarged and swollen, and in some instances form follicular ulcers. He
calls especial attention to a form of shallow ulcer occasionally observed
in the immediate vicinity of the pylorus, usually oval or boat shaped in
outline, [with its long axis obliquely to that of the stomach; this he
attributes to the presence of lardaceous degeneration in the surrounding
vessels. The great rarity of tuberculous ulceration of the viscus, as
contrasted with that of the intestine, is attributed to the inhibitory action
of the gastric juice upon the bacilli, and to the scantiness of lymphoid
tissue in the stomach. In the majority of cases when a tuberculous
ulcer is present in the stomach it produces but few symptoms, and
exerts little influence on the progress of the primary disease, although it
occasionally gives rise to severe hæmorrhage. The condition, however,
which is especially characteristic of phthisis, according to the writer, is
that of chronic interstitial inflammation, leading to destruction of the
gastric tubules, and a more or less diffuse cirrhosis. This condition is
found most marked in the more advanced cases of phthisis with excava-

tion, and the conclusion arrived at is that it is excited by the absorption of toxic substances formed within the pulmonary cavities.

The author afterwards treats of the various forms of dyspepsia met with in phthisis, describing the characters and course of each variety, and the methods of treatment which have been found most satisfactory. He gives a very valuable analysis of 500 cases of dyspepsia in early phthisis, and in the last chapter a very valuable contribution to the subject of perforation of the intestine. The book cannot fail in imparting much useful information on a very practical and every day subject, which is sure to be of service to many. A. D. B.

**The Barnjum Barbell Drill.** By R. Tait McKenzie, B.A., M.D., Demonstrator of Anatomy and Instructor in Gymnastics, McGill University; late House Surgeon Montreal General Hospital. Springfield, Mass.: Triangle Publishing Co.

This is the drill designed by the late Major Fred S. Barnjum, and of its efficiency we need not speak, one has only to look round upon Major Barnjum's old pupils to see the beneficial results of his methods. Dr. McKenzie has conferred a favour by putting the exercises on record in such a useful form. Each of the twenty-two exercises is illustrated by a series of photographs, and a few lines of letter-press are added to direct the learner how to do it and how not to do it. A list of the principal muscles used is appended to each series of photographs, so that physicians can intelligently prescribe these exercises to their patients, calling their attention to those which they especially require. In the treatment of such conditions as lateral curvature of the spine this book will be of great assistance, and its usefulness does not end here, for persons whose occupations are of a sedentary character will find it an excellent "self-instructor" in a form of drill which will exercise all their muscles and keep them in trim. To all such we can recommend the book most highly.

R. C. K.

**Twentieth Century Practice.** An International Encyclopedia of Modern Medical Science. By Leading Authorities of Europe and America. Edited by Thomas L. Stedman, M.D., New York City. In Twenty Volumes. Volume III. Occupation Diseases, Drug Habits, and Poisons. New York: William Wood & Co. 1895.

The third volume of this work has been received by us, and maintains fully the reputation won by the two preceding volumes. The first article is written by Dr. Norman Kerr, of London, who has a very interesting and able paper on Alcoholism and Drug Habits. Dr. Kerr is already well known as a writer on this subject, to which he has given much attention. He treats in separate chapters, the purely toxic effects of narcotics, and the almost maniacal craving for them which is developed in their habitual devotees. The second article is on Shock, by Dr. George

F. Shrady, editor of the *Medical Record*, who deals with the subject from the standpoint of the physician rather than that of the surgeon. Papers follow on Sea Sickness, by Dr. Gihon, of the United States Navy, on Mountain Sickness, by Georg von Liebig, of Munich, on Heat Stroke and Frostbite, also by Dr. Gihon, and on Osteo-malacia, by Prof. Councilman, of Harvard University. The paper on Diseases of Occupation, by Dr. James H. Lloyd, of Philadelphia, is of unusual excellence, and is, we think, one of the most valuable that have been written on this subject. It occupies nearly one-fourth of the volume. Toxicology is dealt with in two articles, both by Canadians. The first by Dr. Beaumont Small, of Ottawa, deals with the more important poisons from the vegetable kingdom, the symptoms and treatment in each being accurately given. The toxicology of the more important metallic poisons follows in a concise and carefully written article by Prof. Stewart, of McGill University. The volume is an important one in the series. The letter press is excellent.                                                          A. D. B.

**A System of Surgery.** By American Authors. Edited by FREDERIC S. DENNIS, M.D., Professor of the Principles and Practice of Surgery, Bellevue Hospital Medical College, New York; President of the American Surgical Association, etc., assisted by JOHN S. BILLINGS, M.D., LL.D., D.C.L.; Deputy Surgeon-General, U. S. A. Volume II., 915 pages, 515 engravings and 10 coloured plates. Philadelphia: Lea Brothers & Co. 1895.

This, the second volume of a splendid work, follows closely on the heels of its predecessor. The first article is by Henry R. Wharton on minor surgery and bandaging, a very complete exposition on the subject, the value of which is much enhanced by the carefully selected illustrations. George R. Fowler writes an exceedingly good monograph on the subject of plastic surgery, and a short article is contributed by William H. Forwood on military surgery, while diseases of the bones falls to the lot of Nicholas Senn, whose work in this line is too well known to require any description. Virgil P. Gibney has a chapter on orthopædics, while aneurism and other diseases of the arteries and veins are dealt with by Lewis A. Stimson and Frederic S. Dennis. Roswell Park writes on diseases and injuries of the head, Frederic H. Gerrish on surgery of the lymphatic system, W. W. Keen on surgery of the spine, while an article on the surgery of the nerves by John H. Roberts brings this volume to a close. The various writers have done their work well and collected a large amount of new material into the work which makes it most valuable for reference and study. Nothing but praise can be given regarding the way in which the publishers have performed their part; the paper is heavy, the printing clear and the binding strong and sightly. This volume is quite up to the standard attained by the first one and will not prove a disappointment to those who have been looking forward to its appearance.                                                          R. C. K.

## A Hand-Book of the Diseases of the Eye and their Treatment. By HENRY R. SWANZAY, A.M., M.B., F.R.C.S.I. Fifth Edition, with illustrations. Edited under the supervision of the author by Louis Werner, M.B., B.C.L. London: H. K. Lewis, 136 Gower street. 1895.

The appearance of the fifth edition of this valuable work plainly shows the appreciation in which it is held by the profession.

It is indeed in our idea one of the best of the smaller text-books on ophthalmology.

The book is considerably fuller and larger than it was in the fourth edition.

The latest methods of examination and of testing refraction are explained. The motion of the pupil in health and disease is made the subject of a special chapter, and the amblyopiae and amauroses are handled at considerable length.

In a work like this which has been reviewed and reviewed time and again, it is difficult and hardly necessary to pick out any special subject for review or commendation.

The treatments recommended are broad, yet well defined, giving the student certain clear lines to follow, without hampering his judgment or overloading his memory with a plethora of details.

The book is gotten up in the same style as the previous editions, clear, legible text, with numerous illustrations.

As a guide for the student or practitioner we can not too highly recommend it; it is good, sound and thorough. 　　　　J. W. S.

## The Care of the Baby. A Manual for Mothers and Nurses containing practical directions for the management of infancy and childhood in health and disease. By J. P. CROZER GRIFFITH, M.D., Clinical Professor of Diseases of Children in the Hospital of the University of Pennsylvania, &c., &c. Philadelphia: W. B. Saunders. 1895.

The author states in his preface, that he has endeavoured in this little manual to furnish a reliable guide for mothers anxious to inform themselves with regard to the best way of caring for their children in sickness and health. We have read what he says with much pleasure, and congratulate him on having fulfilled his task very ably. The manual is distinctly the best we have yet seen. It succeeds in emphasizing the numerous petty details which, to many nurses and mothers appear so trifling, but which we, as physicians, know to be all important to the infant; all its statements are clear, complete and thoroughly up to date.

The first eight chapters deal with the methods of bathing, dressing and feeding children of different ages, the proper physical and mental training necessary for due development, and a description of the ideal for baby's nurse and baby's room.

In addition, it contains a concise *résumé* of the more common diseases

of infancy and childhood, and directions for the management of the various accidents to which young life is liable. Many illustrations assist in rendering the text clear to the reader. We cordially recommend the work as a carefully and scientifically written handbook, especially designed for mothers and nurses, but containing much information which is likely to be of service to students and junior practitioners.     A.D.B.

### Essays in Heart and Lung Disease. By Arthur Foxwell, M.A.. M.D., F.R.C.P., Physician to the Queen's Hospital, Birmingham. London : Chas. Griffin & Co.   1895.

We have read these essays with much pleasure and profit. Most of them, as addresses before various medical societies during the past few years, have appeared in print before now, but collected together in this volume they have all been carefully revised, and much new matter added. Among the more important essays, we note those on Dyspnœa, on Catarrh, on Climate, on the Condition of the Vascular System in Anæmic Debility, on Arterial High Tension, on Hæmoptysis, and on the Antiseptic Treatment of Tubercular Phthisis. All the papers bear the impress of one who not only has had a large experience, but who is also a vigorous thinker. His writings are eminently thoughtful and suggestive. We have much pleasure in recommending this volume of essays to our readers.                                                A.D.B.

### A Manual of Gynæcological Practice. By Dührssen. Translated by Drs. Taylor and Edge.  H. K. Lewis, London.

This is an extremely clearly written work, intended for house surgeons and medical men taking a post-graduate course of gynæcology. The illustrations are good, but as a whole the work is disappointing, not being up to date. The following are one or two examples of omissions. In the article on anæsthesia no mention is made of rhythmic traction of the tongue as a remedy for asphyxia, whereas it is one of the most reliable methods of resuscitation which we have. Neither, when speaking of rendering oneself and the field of operation aseptic, is the use of potassium permanganate and oxalic acid mentioned, these agents being so extensively used on this side of the Atlantic. However, the work has good points as well as bad, as the descriptions of methods of gynæcological examination and also of instruments are both clear and full and will be found useful to the hospital interne and senior student.

                                                                F. A. L. L.

### The American Academy of Railway Surgeons. Official Report of First Meeting. Edited by R. Harvey Reed, Columbus, Ohio.  1895.

This is the report of a meeting held in Chicago last November and contains a list of the officers of the academy, the constitution and by-laws, and the addresses made on this occasion. Besides, there are several excellent papers on subjects of interest to surgeons—as traumatic aneurism, injuries to tendons, railway spine, etc.          R. C. K.

## PRINCIPAL PETERSON.

We are glad to add our tribute of welcome to the new Principal of
McGill University, and, so far as we represent the medical profession
in Montreal, to greet with all cordiality one who, from his position,
must be largely identified with the future welfare of the English-
speaking members of our profession in this Province, and, indeed,
with that of the French-speaking members also. Although among
the former there are many men exercising great influence who are in
no way connected with McGill, they, we believe, would be the first to
acknowledge that without the hearty co-operation of the University
it is rendered still less possible to carry out legislative and other
changes calculated to improve their standing, be it in their relation-
ship to their French *confrères*, or be it in relationship to their
*confrères* in other Provinces.

It is true that in the University the desire for any such change
must emanate from the body most especially concerned, namely, from
the Medical Faculty; yet to meet with success, that Faculty must
act in the name and with the support of the University. Thus the
influence exerted by the Principal upon the Governors and body
corporate of the University is of necessity an influence affecting our
profession. It is in this way that Dr. Peterson becomes identified
with us.

This, however, is by no means the only way in which Dr. Peterson's
influence will be felt. To cite but one other as an example—there is
the action which he must take in one or other direction in connection
with the subject of preliminary education. We have only to recollect
the good work achieved by Sir William Dawson to comprehend what a
force the Principal of McGill can be in directing and giving a special
tone to the education of the English-speaking inhabitants of this

Province. What attitude will Principal Peterson take in reference to the standard of the matriculation examinations of the University ? Will he hesitate to initiate changes in this matter, or will he boldly raise the standard of general education by demanding from those desirous of entering the University a higher level of scholarship ?

There is, we fear, a tendency to cry out *Procul este, profani* whenever any seek to discuss these matters in public print, but in these pages, devoted to the interests of our profession, we can assuredly do nothing but good in voicing our opinions. Taking into consideration the sparseness of the population, the climate, and the prevalence of agricultural pursuits in this country, all of which militate against regular school attendance, save in cities and towns, the state of education throughout the Dominion, from one end to the other, is remarkable for its excellence. This, we believe, is freely acknowledged by all. There is, however, an equally remarkable uniformity of stamp. The teaching is the same whatever the destined future of the individual scholar, and there is far too little encouragement or stimulus given to those of higher mental capacity to rise above their fellows and prepare thoroughly for university and professional careers. The lack of proper preliminary training of our students is felt, or shows itself, for years, if not often for life. This state of affairs is surely avoidable, and in our opinion it rests with the university to demand from the schools a higher excellence in the teaching and grounding of those who purpose entering scholastic and professional careers. We do not hesitate to say that the university can safely make the demand. It is scarce thirty years ago since the English universities, despairing in the oft-repeated attempt to improve education by appeal to the schoolmasters, initiated a series of local school examinations, and at the same time raised the standard of their own primary examinations. The effect was magical ; the schools stirred by rivalry straightway improved their teaching, and ever since the number of university students has steadily increased and their quality has improved. In our neighbouring States, Harvard (to mention but one example) raised its standard of matriculation despite the expostulations of the schools that improvement was impossible, and the schools immediately, and meekly, responded to the demand. There is no valid reason why we should be behind Harvard. It is not money or numbers that make universities great, it is the quality of the graduates. Canada may not inappropriately be compared with Scotland in very many respects, and the greatness of Scotch education and Scotch universities has had its foundation deep in the excellence of the village schools. What the Scotch dominie has achieved that must the Canadian emulate.

In this, as in every scheme that is calculated to raise the professional standard, the medical public looks for the support of Dr. Peterson, and, we think, not in vain. His experience in Dundee has been most favourable. There he had to administer a university college having an environment not dissimilar to that of McGill, a college founded and endowed by the members of an active commercial community, in which the professional courses appealed to the student, and his parents, with greater force than did the purely academical, and there it was that the medical and allied biological schools were most successful. Under his presidency there was gathered together a particularly able body of professors—Paterson in Anatomy, D'Arcy Thompson in Zoology, Geddes in Botany and Reid in Physiology. His foresight in choosing these men has been shown by the fact that each one has made his mark in his own especial branch of work. We may safely assert, therefore, that here in Montreal Principal Peterson promises to be fully in touch with the medical profession and its needs.

## INTER-PROVINCIAL REGISTRATION.

That vexed question, inter-provincial registration, which has occupied the earnest attention of the profession in Canada for nearly thirty years, was undoubtedly advanced a stage at the recent meeting of the Canadian Medical Association in Kingston. The following composed the committee appointed last year at the meeting in St. John to report on this question : Sir James Grant, Drs. Cameron and Pyne from Ontario ; Sir William Hingston, Drs. Marcil, Beausoleil, Chalotte, Parke and Roddick from Quebec ; Drs. Bayard, Christie and White from New Brunswick ; Drs. Farrel and Muir from Nova Scotia, and Dr. Warburton from Prince Edward Island. Two lengthy sessions of the committee were held, so that the matter was thoroughly discussed and the views obtained of the several representatives. No very definite scheme, however, resulted, but the following resolution was unanimously adopted for the guidance of the Association :

" The Committee appointed at the last meeting to look into the " question of inter-provincial registration would beg to express their " regret that by the system which at present obtains, a graduate in " medicine entitled to practise in one Province is not free to exercise " his functions in all the Provinces of this large but sparsely settled " Dominion ;

" That this condition of things prevents the names of medical prac- " titioners in this Dominion being placed on the British register, " becoming thereby British Practitioners, which the Council of Medi-

" cal Education of Great Britain has more than once signified its
" willingness to grant;

" That with this end in view it is, therefore, most desirable that
" there should be a uniform standard of matriculation, a uniform
" standard of medical education, and a uniform method of examina-
" tion for the whole Dominion.

" That to effect this purpose, the Secretary be instructed to com-
" municate with the various Provincial Councils, before their next
" meeting, asking that each Council discuss the question, and, if
" possible, appoint one or more delegates to a Dominion Committee
" for the purpose of adjusting a suitable curriculum and carrying out
" the suggestions herein contained, and that such Committee be
" requested to forward their finding to each of the Provincial Councils
" and to the Secretary of this Association before the next annual
" meeting."

The Committee were fortunate in having present Dr. Pyne, Regis-
trar of the College of Physicians and Surgeons of Ontario, as he was
in a position to give official information regarding the attitude of that
province on this question. He made it plain that the Medical
Council of Ontario was pledged to grant reciprocity to any Province
having a Central Examining Board, and whose curriculum was equal,
in the main, to theirs. With reference to the course of five years of
study now exacted, it was thought by all the members of the com-
mittee who represented Ontario, that four sessions of nine months
each might be taken as equivalent. In fact there was a general
impression that, while the conduct of the Ontario Medical Council in
this connection might at times have been arbitrary, it was not, on
the whole, inconsistent.

We shall take occasion to refer again to this matter in an editorial
way, and trust in the meantime, that the various Provincial Councils
will give the above resolution their earnest consideration, so that, at
the meeting of the Association, to be held next year in Montreal, some
definite scheme for Reciprocity and Inter-provincial or Dominion
Registration will be consummated.

CANADIAN MEDICAL ASSOCIATION.—Officers for 1895-96.—Presi-
dent, James Thorburn, Toronto. Vice-Presidents: For Prince Edward
Island, James Warburton, Charlottetown ; Nova Scotia, Wm. Tobin,
Halifax ; New Brunswick, W. W. White, St. John ; Quebec, Hon. D.
Marcil, Quebec ; Ontario, Fife Fowler, Kingston ; Manitoba, H. H.
Chown, Winnipeg ; North-West Territory, G. Brett, Banff ; British
Columbia, R. E. McKechnie. Nanaimo.   General Secretary : F. N. G.

Starr, Toronto.   Local Secretaries : For Prince Edward Island, H. D.
Johnson, Charlottetown ; Nova Scotia, G. C. Jones, Halifax ; New
Brunswick, Wm. Christie, St. John ; Quebec, J. G. McCarthy, Mont-
real ; Ontario, John H. Mathieson, St. Mary's ; Manitoba, W. J.
Neilson, Winnipeg ; North-West Territory, Geo. Macdonald, Calgary ;
British-Columbia, W. A. Richardson, Victoria.   Treasurer : H. B.
Small, Ottawa.   The place of meeting in 1896 is Montreal.

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—Dr. Geo. B. Fowler has been appointed Commissioner to the
Board of Health of New York in place of Dr. Cyrus Edson resigned.

—Rhinologists should be careful in prescribing the cocaine spray to
nervous and susceptible people having nose and throat troubles.
Many cases have been recently reported where the cocaine habit has
been established in this way.

Miss McFee, of Montreal, has recently obtained from the University
of Zürich the degree of Doctor of Philosophy.   She is a graduate of
the Donalda course of McGill University, and has been studying
philosophy both at Cornell and in Leipzig.

—Onychophagia, being interpreted, biting the nails, is said by M.
Bertillon, the great anthropometric authority, to be a sign of degen-
eracy.   To have a little trick of any kind now-a-days often proves
to be only an outward sign of some inward abnormality.

—Dr. Ruffer, the Director of the British Institute of Preventive
Medicine, recently contracted a severe form of diphtheria in the
course of bacteriological investigations.   He was treated with anti-
toxin serum, and, we are happy to report, is now making good pro-
gress towards recovery.

# Obituary.

## PASTEUR.

If a condition of health is the foremost requisite for a vigorous life, and if the well-being and content of nations before all things depend upon the health of the individuals forming the nations, then he who best ministers to the prevention of disease is the greatest benefactor and stands pre-eminent among his fellows. The world, it may be, is slow to realize this and has not yet merged, if indeed it ever will merge, from that barbaric state of mind in which the Napoleons and those adding to the glory of nations, and to the general death-roll, are accorded more honour than those who avert the incidence of death and add to the years and welfare of the race. Judged by the higher standard the greatest man of this century has just died, and rich as the century has been—richer than all preceding—in noble achievements in every branch of knowledge, abstract and applied, the noblest achievements of all have been those of Louis Pasteur.

The daily journals have devoted columns to biographical notices of Pasteur and it is unnecessary here to dwell upon the details of his life, but it may be well to recapitulate a little of what he has accomplished for science and for the world at large.

While at the present time his name is by the majority associated with great advances in medicine, it is well to bear in mind that the most active period of his life was passed as a chemist, and it was indeed for his remarkable studies in physical chemistry that the Royal Society awarded him its gold medal, the highest honour that it is in the power of that celebrated body to bestow. It was his researches into the phenomena of crystallization that gained him fame as a chemist: it was these same researches that led him insensibly from chemistry to the foundation of bacteriology as we know it. It is strange to think that the whole of our present conceptions of infectious disease, and of our knowledge of the processes of fermentation, and all the enormous strides that have of late been made in establishing upon a scientific basis such vast commercial interests as the making of wine, beer, vinegar, butter and cheese, have followed naturally, step by step, upon observations made into the behaviour of the crystals of certain salts of tartaric and paratartaric acid with regard to their power of influencing the plane of polarization. Yet so it is;

Pasteur's discovery that certain crystals having special characters of polarization could only be produced when micro-organisms were present led him to study the subject of fermentation and to demonstrate for the first time that fermentation is the result of the multiplication and activity of micro-organisms. From this position on the one hand his attention was naturally drawn to the study of the economic fermentations, and to this we owe his remarkable studies, since carried further by Hannsen and others, upon the fermentation and production of beer and wines. On the other hand he was led to become a main factor in exploding the doctrine almost 2,000 years old, the doctrine clearly expounded by Lucretius, that of spontaneous generation. Further, he was led to the discovery, in his fermenting liquids, of anærobic bacteria, thereby again exploding a doctrine till then universally held, that life cannot exist without the presence of free oxygen. Great as is the tribute that medicine owes to Lister it in no wise lessens his fame to remember that the observations whereupon he founded antiseptic and aseptic surgery were a direct outcome of Pasteur's researches upon the part played by bacteria in fermentation.

But to us, and we fancy to future generations, these achievements, sufficient as they are to establish the lasting reputation of any single individual, are of relatively small import compared to the later stages of his work. The great French chemist, Dumas, but little realized what he was accomplishing for humanity when, as president of the commission appointed to enquire into the failure of the silkworm industry of France, he advised the government to employ Pasteur to investigate the matter in the affected districts. The results of Pasteur's investigations, continued through many years, were to clearly prove that the silkworms were affected by a microbic disease, and, commercially, were to save France millions of francs annually. And having once thus learned that diseases could be produced by bacteria, slowly and cautiously Pasteur advanced through a study of infectious diseases, such as anthrax and chicken cholera in animals, until with his researches upon rabies he, the chemist, ventured into the domain of human medicine. While Jenner established the method of conferring immunity against disease by inoculation with material from disease, it was these studies of Pasteur and his associates, Duclaux, Chamberland and Roux, that gave us the explanation to a large extent of the meaning of immunity so produced, and that led the way to the more recent triumphs, not only in the prevention, but in the cure of disease. We are, it is true, only at the beginning of our knowledge of these matters, and it may be that in another century infectious diseases, if

not entirely banished from among civilized communities, may form a quite inconsiderable item in the bills of mortality; nevertheless, what has already been accomplished is marvellous, and the illumination that we in medicine have received through this work inaugurated by Pasteur is truly beyond description.

As that strange contemner of applied science, Ruskin, admits in his "Frondes Agrestes," "It is ordained for our encouragement that every step we make in the more exalted range of science adds something also to its practical applicabilities." Never was this more truly proved than it has been in connection with Pasteur's observations upon dextro- and lævogyrous crystals. But here it was granted to the man himself to find the numerous applications, and—what the gods have granted to few of earth's greatest—to see in his lifetime the fruition of his labours.

*J. G. Adami.*

Major Thure Brandt, the originator of the system of massage which bears his name, is dead.

Prof. Hoppe-Seyler, of the University of Strassburg, the greatest physiological chemist of our time, died suddenly on August 12th.

Dr. K. Schimmelbusch, first assistant at Prof. von Bergmann's clinic, died on August 2nd, aged 35 years. His researches in regard to the asepsis of wounds had already established his reputation.