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Original Communications.

PROSTATECTOMY.

By GEO. E. ARMSTRONG, M.D.,

Mr. President and Gentlemen:—In a lecture in the Leeds Post-Graduate Course, published in the *London Lancet* in February, 1888, and again in an address in the Section of Surgery at the Annual Meeting of the British Medical Association held in Leeds, August, 1889, Mr. A. F. McGill spoke of the treatment of retention of urine from prostatic enlargement, by making a supra-pubic opening into the bladder and through this opening draining the bladder and removing the projecting growth from the prostate gland. To facilitate discussion, Mr. McGill put his ideas before his *confrères* in the form of the following propositions:—

(1) That prostatic enlargements which give rise to urinary symptoms are intravesical, and not rectal.

(2) That retention is caused by a valve-like action of the intravesical prostate, the urethral orifice being closed more or less completely by the contraction of the bladder on its contents.

(3) That in many cases self-catheterism is the only treatment required.

(4) That when catheter treatment fails or is unavailable, more radical measures are necessary.

(5) That this treatment, to be effectual, should for a time thoroughly drain the bladder and permanently remove the cause of the obstruction.

(6) That these two indications are best fulfilled by a supra-pubic rather than a urethral or perineal operation.

In his address Mr. McGill says that he believes that Dr. Belfield, of Chicago, was the first to perform this operation. Dr. Belfield successfully removed a middle lobe of the prostate by the supra-pubic method, in October, 1886.

Mr. McGill's results were so satisfactory (eight out of the ten remaining well) that I decided to treat four cases that came into my wards in the Montreal General Hospital during the present summer by his method. I felt the more confidence in doing so because other surgeons at the Leeds meeting spoke so favourably of the results Mr. McGill had obtained, after seeing his cases and the tumours he had removed. Mr. Atkinson reported five cases. Four were alive and well, and the fifth died of pneumonia after recovering the power of micturition. Mr. Harrison and Mr. MacEwen were among those who thought favourably of the operation. I am sorry to say that I have not been equally successful, but my cases have been very instructive to me, and I hope that a brief account of them may be of interest to you.

My first case, M. C., aged 60, was admitted to the Montreal General Hospital on the 20th April, 1892. He complained of frequent and difficult micturition, also of pain over sacrum, and pain in front over bladder. These symptoms began two years ago. They have progressively increased, until now he urinates from six to ten times during the day and ten to fifteen times during the night. Respiratory, digestive and circulatory system normal. Had rheumatism three years ago. He has a double inguinal hernia. Upon examining the prostate per rectum, it is found very moderately enlarged, presenting a smooth, even surface. It is not tender, although pressure upon it produces a painful sensation at end of penis. A soft No. 8 rubber catheter passes easily. Residual urine, 4 oz. Urine pale amber colour. Neutral reaction, sp. gr. 1010. A small quantity of mucus and pus present. About 40 per cent., by bulk, of albumen. No sugar. Microscopically—Pus; granular casts; triple phosphate crystals; no blood corpuscles. On the 31st May, through a

supra-pubic opening into the bladder, a small, hard nodule, constricted at its base, was found just at and below the commencement of the urethra. I cut across its base with a Volkman's spoon, and removed it from the bladder by means of a long-handled pair of hæmostatic forceps. For the first 12 hours urine was deeply coloured red. No blood after first 24 hours. Temperature and pulse normal throughout. On the 15th June, 15 days after the operation, he passed water naturally through the urethra. Wound completely closed on the 1st July, 21 days after operation. He then urinated four or five times during the day and two or three times during the night. His general condition was good, and there was no residual urine.

CASE II.—J. H., aged 67. Was transferred from the Medical to the Surgical Ward on the 31st July, 1892. He complained of inability to pass urine, loss of appetite and shortness of breath. Has had difficulty in urinating for twenty years. For five months has been unable to pass any urine without the aid of the catheter. Is considerably emaciated. Temperature, 100° ; pulse, 100; respiration, 28. Mild delirium at night. Urine of a grayish-white colour; acid; sp. gr., 1004; only a trace of intrinsic albumen: no sugar; a large quantity of pus and kidney cells (large, round cells, with a distinct large, round nucleus.) Urine contains 3 grs. urea to the ounce. Amount of urea passed in 24 hours, 168 grs. The pain and irritability of the bladder is so great that he asks to be catheterized 10 to 12 times in the 24 hours. By rectal examination the prostate is found somewhat enlarged. Arteries sclerosed: heart enlarged: lung markedly emphysematous and hyper-resonant; tongue dry, covered with a brown fur and fissured transversely. The diagnosis was chron. nephritis with cystitis and prostatic obstruction to outflow of urine from the bladder. This patient was transferred from the Medical side as incurable, and the advisability of operating upon him in his then present condition was open to very serious question. In favour of an attempt to relieve him by operative treatment it was said that it was the only way to give him any chance of even a partial recovery; that the obstruction to the outflow of urine was a cause of the

persistance of his cystitis and nephritis, if not the initial cause : that a supra-pubic opening into the bladder would provide free drainage to that organ. For these reasons the operation was performed on the 2nd August, and a hard, round, sessile tumour was removed from the middle lobe of the prostate. This was about the size of an English walnut. Another, the size of an almond, was removed from the left lobe. Efficient drainage was secured by the insertion of a large rubber tube. He never rallied after the operation. He complained of vesical and rectal tenesmus. Pulse was rapid and small. He became delirious, and died 30 hours after the operation. No autopsy was permitted.

CASE III.—W. R., aged 72. Admitted to Hospital 2nd July, 1892. Complained of pain over bladder and disability to pass his urine. He was relieved after much difficulty by passing a No. 2 silver catheter. The difficulty was increased by the presence of a number of false passages. He has passed no urine except through a catheter for four years and eight months. Urine alkaline, strongly ammonical and offensive. No kidney cells. By rectal examination, prostate was found very little, if any, enlarged. On the 4th August, through a supra-pubic incision, this large mass was enucleated from the left lobe of the prostate. This man has, up to date, made an exceptionally good recovery. His urine is clear and odourless, and contains only a trace of pus. I feared that in this case the atony of the bladder was so great that the power of expelling urine would never be recovered, but in this I have been happily disappointed. He now urinates easily and comfortably. He can hold his water for five or six hours during the day, and only gets up two or three times during the night. His appetite is good, and his general condition excellent.

CASE IV.—J. G. S., aged 59. Admitted to Hospital 15th September, 1892, complaining of inability to pass water. About four years ago he first noticed increased frequency, and shortly afterwards he experienced difficulty in micturating. He says that for two years, during both night and day, he has urinated, on an average, every two hours. Two weeks ago, complete

retention followed a severe wetting and chilling. Since then he has been unable to pass any water without the aid of a catheter. Temperature, heart and lungs normal. Arteries atheromatous and beady at wrists. Urine turbid, and contains muco-pus; acid; sp. gr., 1010; a small quantity of intrinsic albumen; no sugar. Microscopically—Triple phosphate crystals and pus cells. No renal epithelium or casts. A No. 8 elastic catheter introduced with difficulty. A No. 6 *coudé* passes easily. On examining prostate per rectum, it is found enlarged, but not markedly so. At the operation, on the 9th September, 1892, a well-defined projecting outgrowth from the prostate was found occupying a position below and on both sides of the vesical end of the urethra. It was enucleated and removed. On the evening of the day of operation the temperature rose to 101° F., and the pulse to 120. Bloody discolouration of urine less than in previous cases. His condition 72 hours after operation was good; temperature normal, pulse improved, and urine flowing freely. Shortly afterwards, unfortunately, the urine became very scanty, pulse shabby, and, in spite of stimulation, he rapidly sank and died.

The experience gained in these cases enables me to confirm many of the propositions laid down by Mr. McGill. In all my cases, any information concerning the intravesical prostate derived from an examination of the rectal prostate was very meagre and misleading. In my four cases the rectal surface was smooth and not greatly increased, while from the vesical surface projected tumours of considerable size, quite sufficient, as proven clinically, to act as an obstruction to the outflow of urine. I also find that the supra-pubic entrance gives the operator perfect command over the seat of disease, and also sufficient drainage to the diseased bladder. Much more thorough treatment can be applied than is possible by any modification of Mercer's or Bottini's method. In only one case did I remove the growth by cutting. In that single case there existed a single nipple-like projection, having a constricted base, which was easily divided. This rounded, tumour-like projection came forward over the entrance to the urethra from the middle lobe,

and it was easily seen how, on an attempt being made to urinate, it would drop into the urethral opening and prevent the exit of urine. In the other cases, the only cutting was the division of the mucous membrane over the prostate by means of blunt-pointed scissors, just sufficient to admit the end of the finger, and then the tumour was shelled out, the mucous membrane covering being torn sufficiently to permit its escape. Hemorrhage is troublesome, and I think often requires more efficient control than is given by hot water. In three cases I packed the bed from which the tumour was shelled out with sticky iodoform gauze. This was very satisfactory. The gauze was removed in 24 or 48 hours. The packing is in front of the orifices of the ureters, and thus did not stop the flow of urine into the bladder. Mr. Keys has lately employed a graduated pad, which he pulls down against the bleeding surface by means of a strand of silk brought out through the urethra and secured at the end of the penis.

Lastly, in regard to the anæsthetic, I have used ether; but if there is good ground for the oft-repeated assertion that ether may do damage to the kidneys in these old men, it would be well to substitute chloroform for ether. This may be done with more confidence and a greater degree of safety on account of the position in which the patient is placed for supra-pubic cystotomy.

The mortality attending this operation limits its performance to the few advanced cases unrelieved by any other method. On the other hand, delay which allows the patient to drift along until general deterioration and changes in the kidneys are so far advanced as to render operative treatment hazardous, is unscientific and unsurgical. A man with obstructive disease of the prostate is sailing between Charybdis and Scylla. I don't see anything in the operation itself, performed on a man whose other organs are healthy, that should make it fatal; and I believe that increased knowledge of the pathology of prostatic disease and its sequelæ, with an improved *technique*, will enable us to afford relief to a greater number of this class of patients in the future than at present.

REPORT ON THREE PROSTATIC TUMOURS REMOVED BY DR.
ARMSTRONG.

BY PROFESSOR ADAMI, M.A., M.D.

These three tumours were sent to the Pathological Laboratory in bottles labelled respectively: 1. W. R., age 72; removed August 4th, 1892. 2. J. H., age 67; removed August 2nd, 1892. 3. — S.; removed September.

All the three are firm, nodular and lobulated masses, which on cutting present a fibrous, fasciculated appearance, with here and there minute cyst-like cavities in the fibroid material. No. 2 is the smallest, and forms but a single encapsuled mass, 3 cc. by 2.3 in its greatest diameters. No. 1 is the largest, and is composed of three separated lobules, the largest 6 ccm. by 3.5 ccm., and very irregular in shape, the other two each 3.5 by 2.5 ccm. No. 3 is also multiple, and of fair size, there being three large and one small lobules, joined together at one point by dense capsular fibrous tissue; the largest of these bodies is an oval mass, 5 cc. by 4 by 2.5 cc. On section, slight differences are to be made out macroscopically. No. 1 is densest in structure, most fibrous, and shows the least amount of cavitations. No. 2 is very dense, but presents small cysts filled with greyish granular material. No. 3 is softer, and shows numerous comparatively large cysts containing fluid.

MICROSCOPICAL EXAMINATION.

All three tumours are practically identical in structure. All present, in certain regions, typical acini of the prostatic gland substance cut across, showing the large columnar epithelial cells resting upon a nucleated layer of smaller cells with basement membrane; while the lumen of many of the glands contains a granular substance, probably portion of the albuminous and mucinous secretion precipitated by alcohol, together with a certain amount of cell debris. In other regions the acini are somewhat dilated and cystic, and here the epithelium is more cubical, while the small papillary outgrowths of the epithelium are not so well marked. But around the acini there is in all cases a very definite increase in the muscular or fibro-muscular stroma. All three specimens present in parts evidence of a fibroid degenera-

tion of this muscular stroma, the plain, spindle-shaped, non-striated muscle fibres becoming separated and atrophied, and replaced by clearer, more translucent connective tissue. This condition is most advanced in Specimen 1 (the smallest and firmest of the tumours), although even in this it is not very pronounced, and there is no very great thickening of the fibrous coat of the arteries in the affected regions, such as is seen in advanced fibroid prostate. We have thus, in all three cases, to deal with a true hypertrophy of prostatic tissue, a hypertrophy affecting all the elements of the gland. The condition may be spoken of as a partial or localized hypertrophy of the prostate.

It is questionable whether such growths as these should be described as tumours, save in the most general sense of the term, for here we are dealing with neither a neoplastic nor truly a metaplastic growth. The specimens are not true myomata, such as occasionally are found in connection with the prostate, and to describe them as myoadenomata tends to veil the fact that they are nothing more nor less than hyperplastic prostatic tissue.

I am of opinion that the explanation of such localized overgrowths of the prostate is to be found primarily in the fact that the gland originates as a series of acini, each of which is surrounded by a coat of plain muscular tissue, while at a later date groups of these acini become surrounded by a common sheath of muscular or fibro-muscular tissue.

[As my friend W. Griffiths points out (*Jour. of Anat. and Phys.*, Vol. xxiv., 1890), the explanation of this peculiarly rich muscular coating is to be made out from the mode of action of the gland. The epithelial cells pour their alkaline and albuminous secretion into the relatively large lumen of the acini, and here, in the absence of any special reservoir, it is stored up, Immediately antecedent to the emission of the semen, this prostatic secretion has to be suddenly poured out into the urethra. This act is brought about by the strong contraction of the muscular covering of the individual acini, whereby the prostatic secretion is ejected.]

Thus the prostate is composed of numerous groups of highly

specialized and partly independent acini, and this very mode of structure leads to the possibility of localized overgrowth of portions of the gland. In this connection it is interesting to study all these three specimens (but more especially Nos. 1 and 3), and to note how the tumours are made up of individual lobules well marked off, and in some instances easily separable from the neighbouring lobules, and these present frequently differences in the relative amount of glandular and muscular substance, and the condition of the same.

It would be interesting to determine whether these localized overgrowths are truly cut off and capsulated in lots, so that the secretion has no means of outlet into the urethra. This, so far, I have been unable to determine. The condition of the epithelium of the greater portion of the tumours—its typical columnar nature—is against complete encapsulement, for remembering how chronic are such growths, were the ducts obliterated we should expect to find the epithelium atrophied by pressure and reduced to a cubical or flattened condition, as indeed is the case in the cystic areas. In these latter alone can one suppose that there has been obliteration of the ducts; but, as I have said, these latter form but a relatively small portion of the masses.

The importance of this fact lies in its bearing upon the nomenclature of the condition. For only if in these bodies we are dealing with independent masses of gland tissue, devoid of natural outlet for their secretion, can we rightly, I hold, speak of them as being adenomata? Otherwise we must regard them, as I have throughout this report, as examples of localized hypertrophy.

EMPYÆMA OF THE ANTRUM OF HIGHMORE.*

BY H. S. BIRKETT, M.D.,

Junior Demonstrator of Anatomy, McGill University; Laryngologist to the Montreal Dispensary.

The frequency of occurrence of empyæma of the antrum, and that it is often regarded and treated as chronic nasal catarrh, is my excuse for presenting this subject for the consideration, and, I trust, to the interest, of the members of this Society.

Amongst the causes we have dental caries and alveolar periostitis; these are regarded by Heath, Semon, Lublinski, Fraenkel, Schmidt, Schech, Stoerk, Heryng and McBride as almost the only causes. Whereas, on the other hand, as supporters of the nasal origin of the disease we have Zuckerkandl, Zeim, Krause, Hartmann, Gougenheim and Baratoux.

That both of these sources are quite correct is supported by seven of my own recorded cases, where in five of them the cause lay in defective teeth and in two of them the trouble supervened upon an ordinary acute rhinitis, the teeth in the one case being perfectly sound, and in the other there were no teeth, the patient having worn a plate for years. So that we have undoubted proof that both these sources may be the origin of the trouble, and not that all cases are caused by dental caries or that all cases must be of nasal origin. Statistics of reported cases show that dental caries is, however, the most frequent cause. Amongst other causes may be mentioned: (a) Occlusion of the ostium maxillare from an hypertrophic rhinitis. (b) Polypi. (c) Syphilis. (d) Struma. (e) Traumatism. (f) Facial erysipelas (Schech.) (g) Division of the infra-orbital nerve (Langenbeck.)

According to Zuckerkandl, the condition of the mucous membrane at the initial stage of the inflammation is a general hyperæmia, with small ecchymotic spots scattered here and there. This is followed by a serous exudation, which subsequently degenerates and becomes purulent.

Of all the subjective symptoms, we find that a discharge from one nostril is the one most frequently complained of by the

* Read before the Medico-Chirurgical Society of Montreal.

patient, or, as it is most commonly called, catarrh. Next in order is the fetid smell and disagreeable taste in the mouth. In this respect empyæma of the antrum differs from atrophic rhinitis associated with ozæna, in that in the former (empyæma of the antrum) the sense of smell remains intact and the patient himself alone is conscious of the odour, whereas in atrophic rhinitis the olfactory sense is so dulled or absent that the patient becomes objectionable only to those who surround him. The discharge is large in quantity, so that several handkerchiefs are soiled during the day. The amount of discharge varies from one time of the day to another—generally more the first thing in the morning; it also varies with the position of the patient—when lying down the antrum becomes emptied to a certain extent, and when arising what has escaped flows from the nostril. The discharge is of a canary-yellow colour, purulent in character, and varies in consistency. Usually the discharge is unilateral, although there are a few recorded cases of bilateral empyæma.

Pain, as a rule, accompanies empyæma of the antrum, and varies in intensity and locality. It may be so slight as not to be complained of, and elicited only upon questioning the patient—this is especially the case in the chronic form; or it may be so violent as to be the only symptom complained of, as is usually the case in the acute forms of inflammation. The pain is located over the malar or nasal bones or in the supra-orbital regions, partaking of a neuralgic character, coming on gradually, increasing until an acme is reached, and suddenly passing off. This is explained by the gradual accumulation of the pus within the antrum until it finds, suddenly, an exit. Occasionally, obstruction to the nasal respiration on one side is complained of, as in the case presented.

“In a certain number of these cases, the beginning of these symptoms can be traced to a severe attack of toothache, followed by swelling of the face, and when this history is present the diagnosis is much facilitated.”—*McBride*.

The general health may be somewhat below par, the acute cases more especially so, which may be ushered in by chills, followed by slight febrile disturbance.

Proceeding next to the objective symptoms, it is well to first spray a small quantity of a 5 per cent. solution of cocaine into the affected nostril, because in these cases of empyæma, when the discharge is of an irritating nature, there is produced either an acute or chronic inflammation of the mucous membrane, attended with moderate swelling, which obstructs one's view of the middle meatus. This swelling having been reduced, our attention is now directed to the middle meatus. Here one observes a quantity of lemon-yellow coloured discharge covering the anterior extremity of the middle turbinated bone, or, if it be of sufficient quantity, may be noticed covering the inferior turbinated bone. If with a probe armed with a little cotton wool the secretion is wiped away, it will be seen that the secretion is coming from between the middle turbinated bone and the outer wall of the middle meatus, and after thoroughly wiping away all the secretion, it will be noticed that in a few minutes there is a large quantity of secretion re-collected. This accumulation may be made more rapid in some cases by turning the patient's head away from the affected side, thus facilitating the exit of the secretion. This rapid accumulation serves to distinguish it from an ordinary purulent rhinitis; and the situation of the discharge, between the middle turbinated bone and the outer wall of the meatus, makes the diagnosis more sure than if seen coming from the inner surface of and above the middle turbinated bone, for then such cases have an associated affection of the ethmoidal or sphenoidal sinuses. The condition of the middle turbinated bone and its surroundings are next to be noticed. As a rule, the mucous membrane covering the anterior extremity has undergone a hypertrophic or myxomatous change, or there may be actual osteoid hypertrophy of the middle turbinated bone. On the outer surface of the middle turbinated bone, and about the region of the ostium maxillare, there may be a small number of very vascular polypi aggregated together, and upon their removal the escape of pus from within the antrum is noticed to be more rapid.

Corroborative evidence is furnished by the following measures:

(a) Percussion over the superior maxillary bone on the

affected side may elicit pain, and in some cases where actual absorption of bone tissue has taken place crackling may be felt.

(b) Succussion, as suggested by Frontis, is only of value where the pus is rather fluid and the antrum contains air.

(c) Redness of the gums on the affected side has been observed by McBride. This was noticeable in two of my cases.

(d) Examination of the mouth may prove the existence of defective and sensitive teeth, and in some cases—it occurred in two of mine—a small sinus is observed either in the centre of or above the alveolar ridge, and from the mouth of this pus may be seen to exude. A probe passed into the sinus will detect carious bone and sometimes enter the antrum.

Actual opening on the side of the face, close to the nasal bone, and communicating directly with the antrum, I have seen in two cases. This condition, so far as I have been able to ascertain from the literature on the subject, is not mentioned even in the so-called classic works on rhinology. This condition of itself would be positive evidence of the previously existing empyæma.

(e) *Exploratory Puncture.*—This may be carried out by thrusting a strong trocar through the outer wall of the maxillary sinus about the centre of the canine fossa, or by means of a suitably curved one an entrance may be effected through its inner wall just behind the anterior extremity of the inferior turbinated bone. Aspiration of the antrum through the ostium maxillare, as suggested by Hartmann, is a difficult and at the same time an uncertain method.

These last-named measures should only be used if there were any doubt as to the existence of an empyæma, and where the teeth on the affected side were sound; but should there be defective teeth, then the first upper molar should be selected, and through its posterior socket a drill be made to penetrate into the antrum.

Finally, trans-illumination, as first suggested by the late Voltolini and Cossolino, may prove a further means of corroborative evidence. This method is carried out as follows:—The room in which the patient is must be absolutely dark.

Place a small electric lamp in the mouth, and the lips are to be firmly closed over it. It is now to be observed that in case the maxillary sinus of either side be filled with purulent fluid or solid tumour the rays of light are prevented from passing through, and that that side of the face is totally dark, whilst on the non-affected side a bright glow is seen on the cheek just below the infra-orbital margin. The translucency may be modified by certain conditions. If the walls of the sinus be denser than usual, or the mucous membrane be thicker, or the cavity of the sinus be small, then the light area may not be so bright as in conditions entirely opposite. In fair persons this light area is more distinct than in dark complexioned people. If the sinus contains a cyst, the bright area is especially distinct.

The course which an empyæma may take varies: (1) If only moderate in degree it may resolve, the pus undergoing absorption—an exceptional issue. (2) Or it may end in a chronic discharge from the nose. (3) Or it may break through on to the face and leave a discharging sinus in which necrosed bone may be detected. This condition was met with in two of my cases.

Organs which may indirectly be affected by empyæma of the antrum are the larynx and pharynx, exciting reflex cough, nausea and retching. The orbit has in a few cases been involved, producing, according to Schech, protrusion of the eyeball, with atrophy of the optic nerve, and, according to Ziem, narrowing of the field of vision and glaucoma. In a case related to me by Dr. Buller, keratitis was produced, which got better upon emptying the antrum of the pus contained in it.

Empyæma of the antrum may be confounded with—(1) Foreign bodies, including rhinoliths. From this it is differentiated by the fact that foreign bodies, such as peas, beans, buttons, etc., are found chiefly in children, whereas empyæma in the child is rare. Regarding rhinoliths, on the other hand, they are very rare in children and comparatively common in adults. Then the objective symptom as ascertained by the probe will reveal the presence of a foreign body. (2) Purulent rhinitis. This generally occurs in children of a strumous or syphilitic diathesis, the corroborative evidence of which is to be found in the

general constitution. (3) Syphilis, acquired. Here one finds ulceration chiefly of the septum, and the presence of carious bone being detected by the probe. Then the history of early infection.

Treatment.—The main objects in treatment are (1) a free exit for the pus, and (2) the destruction of the pyogenic membrane in the chronic cases. The means of accomplishing the first object are four. (1) That, advocated by Hartmann and Krause, of cleansing the cavity of its abnormal secretion by syringing through the ostium maxillare. This is accomplished by the use of a suitably curved canula, as devised by Hartmann himself, one of which I here show you.

Other advocates of this treatment further advise a partial or complete removal of the middle turbinated bone. Comment on this method is hardly necessary, as it commends itself to all as unsound in surgical principles, namely, draining from the highest level of a collection of pus. The associated removal of the middle turbinated bone, either partially or in its entirety, is a painful and unnecessary procedure.

Mikulicz's method of opening through the inferior meatus is an advance of the former method; but in many antra the floor is below the level of the floor of the inferior meatus, and thus we do not get drainage from the most dependent place. The same argument may be made against the opening of the antrum through the canine fossa, as advocated by Heath and others.

The more generally accepted method, and the one followed out in my own cases, is as follows:—Having decided which tooth is most likely to be the cause, presuming that dental caries or alveolar periostitis has been the exciting cause, this one is to be extracted—by preference the first molar. Then the drill should be inserted into the posterior socket and made to penetrate the antrum. To be sure an entrance has been effected, a dental excavator should be passed into the opening and rotated. The opening thus made is to be enlarged by means of a reamer. Should, however, there be a fistulous opening in the gum, this spot should be selected. If there are no teeth, then an incision through the gum down to the alveolus must precede the use of

the drill. In case the teeth be sound, then drilling between two of them is advisable, or let the antrum be opened in the canine fossa. Upon withdrawal of the drill, one must not be disappointed if pus do not flow out immediately, for it may not do so for two reasons: (1) The pus may be too thick and the tearing of the mucous membrane by the drill may form a valve to the opening, or (2) as shown by Giraldès, the antrum may be divided by septa of bone, and consequently a first attempt at reaching the pus might be ineffectual.

Having reached the cavity, it is next to be syringed out through the newly made opening. This may conveniently be done by Hartmann's canula or an ordinary Eustachian catheter. The solution to be used is preferably bi-chloride (1:5000), which when injected into the antrum will run out through the nostril.

The next step is the adjustment of a drainage tube, and upon the careful adjustment of the tube the successful issue of the case depends. The distance from the surface of the gum to just within the cavity of the antrum is to be carefully measured; this is well done by means of the dental excavator being passed just so far as to allow its point to be rotated within the antrum. This being ascertained, the tube should be about $\frac{1}{2}$ in. longer, so that as readily as the pus collects it may be carried off. I regard this of some practical importance, for I have seen cases where the tube has been so long as even to touch the roof of the orbit, and although the cavity was flushed out, yet no drainage took place, and the pathological process continued for months—in one case for two years, and it was only on greatly shortening the tube the case got well. As to kind of drainage tube, I use the canula of a moderate sized trocar cut down to the required length. Through the shield two small openings are made, and by means of wire passed through these openings the tube is held in position by being fastened to the neighbouring teeth.

The treatment now consists in having the antrum washed out three times daily with an antiseptic solution, preferably Listerine (3i-5i), as with any stronger antiseptic, such as bi-chloride or carbolic acid, toxic symptoms might be induced. Every other day in the chronic cases of empyæma, when we have to deal

with a pyogenic membrane, a small quantity of hydrogen peroxide may be injected into the antrum after having just cleansed it with the Listerine solution. This treatment must be continued as long as the solution coming through the nostril remains coloured with purulent matter. When this ceases the tube may be removed, and if after its removal for several days the antrum remains clear, it may be left out permanently and the opening allowed to close. In some of the chronic cases a small curette may be introduced through the external opening and the cavity of the antrum scraped. Insufflation of iodol or iodoform or the packing of the cavity with iodoform gauze has been carried out successfully by Krause and others.

In cases where the pus has made an opening on the face, the antrum should be treated as just described, and the sinus opened, scraped and any loose pieces of bone removed, and the wound kept open by means of iodoform gauze and allowed to heal from below. Any co-existing nasal trouble, such as hypertrophy or myxomatous degeneration of the mucous membrane, or polypus, should receive treatment at the same time.

CASE I.—*Associated with Polypoidal condition of the Mucous Membrane of the Left Middle Turbinate Bone.*—Mr. A. C. C., age 22, kindly referred to me by Dr. G. A. Brown, was seen by me three years ago, complaining then of a constant fetid discharge from the left nostril, which had existed for several years. There was marked pain on the left side of face and forehead, described by the patient as neuralgia. The discharge from the nostril was very profuse, several handkerchiefs being soiled during the day. The discharge was of a dark yellow colour, of the consistency of cream and purulent in nature. A dry irritating cough, with decided huskiness of voice, was complained of.

Examination of the nose showed a marked polypoidal condition of the mucous membrane of the left middle turbinate bone, with considerable thickness of the bone itself. These parts, as well as the inferior turbinate bone, were bathed in purulent secretion, and after carefully wiping it away the secretion could be seen issuing from between the middle turbinate bone and

the outer wall of the middle meatus. This secretion was found also lying on the upper surface of the soft palate, in the posterior wall of the pharynx and in the inter-arytenoidean space. The vocal cords were much thickened and congested. Pressure over antrum elicited no tenderness—no dental caries present.

After having removed the polypoidal thickening, the first upper molar on the left side was extracted and an opening effected into the antrum through the posterior socket. A small spiral wire drainage tube was inserted and the cavity syringed out with hydrogen-peroxide three times a week, and with Listerine three times daily. Three months afterwards the secretion of pus had greatly diminished and the voice had become stronger. The ultimate issue of this case I have not learned, as the patient left the city suddenly and for parts unknown.

CASE II.—*Empyæma due to Acute Rhinitis*.—Miss C. G. came to me in August, 1890, complaining of a severe neuralgic pain on the left side of face, with a discharge from nostril on the same side, which had existed for the past ten days, having been preceded by a severe cold in the head. The senses of smell and taste were markedly obtunded for six days during the attack of acute cold. Examination of the left nostril revealed pus coming from space between the middle turbinated bone and the outer wall of the middle meatus. The mucous membrane of both nostrils was moderately swollen and hyperæmic. Left side of the face noticeably swollen and decidedly tender in the canine fossa. No dental caries was present, as the patient had had her teeth extracted several years ago and wears an artificial set. An incision down to the alveolar edge was made, and about the situation of the first upper molar the drill was entered, opening the antrum and allowing of the escape of a teaspoonful of horribly fetid pus. The cavity was irrigated with solution of bi-chloride (1:5000) and subsequently a solution of Listerine used. Four weeks from the date of opening all discharge had ceased. A month later, when seen, the opening had firmly closed and the patient was perfectly well.

CASE III.—*Cause—Dental Caries*.—Mr. F. F. E, age 36,

kindly referred to me by Dr. England, complained of a fetid discharge from right nostril, which came on four months ago, being preceded by severe pain in right side of face and head, relieved entirely when flow of pus set in. Examination of the nose showed purulent secretion coming away from the region of the anterior extremity of the right middle turbinated bone. Position of head did not materially accelerate flow of pus. The mucous membrane of the middle turbinated bone was considerably hypertrophied and hyperæmic. When pain in face set in had first upper molar extracted, thinking it was the cause of the face ache. The antrum was drilled through the space where the tooth had been extracted, giving exit to a small quantity of pus.

The subsequent treatment consisted in the syringing out of the antrum with solution of creolin (1:500), the tube being removed one month later, as all symptoms of empyæma had disappeared, and the patient has remained well ever since.

CASE IV.—*Empyæma Affecting both Antra. Dental Caries as Cause.*—Miss B. consulted me a year ago in reference to a disagreeable discharge from right nostril which had existed for one week. The discharge was preceded by a most severe pain in the right side of the face, attended with swelling of the same side of the face and beneath the right eye. Relief to the pain was followed two days later by a sudden discharge of fetid matter from the right nostril. The swelling of face and beneath right eye also disappeared. The mucous membrane of the right nostril was much swollen and hyperæmic; but under the influence of a 5 p. c. sol. cocainè, the swelling was so reduced as to bring the middle meatus into view, and in the region of the outer surface of the anterior extremity of the right middle turbinated bone a quantity of purulent secretion was collected, which soon re-collected after removal.

Marked redness of the gums of the right side was observed, and tenderness elicited upon pressure over the superior maxilla.

Under ether, all the defective teeth on the right side of the superior maxilla were extracted, and the antrum opened by means of a drill passed in through the posterior socket of the

second molar. The antrum was then emptied of its purulent contents by syringing with a solution of bi-chloride (1:5000.) The treatment, as carried out by the patient herself, consisted in syringing out this cavity three times a day with a solution of Listerine (5i—5i) and the occasional use of hydrogen-peroxide. Two months from date of operation the discharge had ceased and tube removed. Two months later still, patient wrote complaining of the *left* side of face aching, and of a yellowish discharge from *left* nostril. Examination of this nostril shows a moderate amount of purulent secretion coming from the space between the left middle turbinated bone and the outer wall of middle meatus; this secretion does not readily re-collect after once removing it, and the re-collection is not increased by altering the position of the head. There is no tenderness in canine fossa and no redness of gums. Several defective teeth in the upper jaw left side. These were extracted and the antrum drilled into through the posterior root of the second bicuspid. Drainage tube left in opening and patient directed to syringe out antrum three times daily. Three weeks afterwards the solution syringed into antrum came out perfectly clear, and continued to do so for several days; the tube was then left out and opening allowed to close. Three months later the patient was still perfectly well.

CASE V.—*Empyema Associated with Necrosis of the Superior Maxilla.*—Mrs. W. kindly referred to me by Dr. J. H. Bell.

Four years ago this patient suffered from severe pain in the left side of face, accompanied by considerable swelling; this was followed by a discharge of matter into the mouth from the neighborhood of a defective tooth in the left side of the upper jaw. This tooth (first molar) was extracted, and since then a purulent discharge has continually come from the site of tooth, as well as from the left nostril. Two years later the face again swelled up and broke out on the left side of face close to the nasal bone and just below the left eye. This has continued to discharge ever since. About half an inch to the left of the middle line of the nose, and half an inch below the infraorbital

margin is a sinus whose opening is surrounded by granulation tissue. A probe passed into sinus has a direction downwards and outwards, touching carious bone. Opposite the situation of the left upper first molar is another sinus extending upwards for one-eighth of an inch and coming in contact with carious bone. In the left nostril, just behind the anterior extremity of the inferior turbinated bone, is a small button of granulation tissue, and a probe bent at right angles passes outward for one-quarter of an inch and comes upon necrosed bone. Springing from the outer side of the left middle turbinated bone is a polypus of moderate size reaching to just below the level of the edge of the middle turbinated bone. A moderate amount of purulent secretion is seen covering the polypus and adjacent structures.

This polypus was first thoroughly removed and then the antrum was drilled into through the small sinus in the alveolar process. As soon as opened, a probe could be passed readily from the opening in the alveolar process out through the opening on the face. A drainage tube was inserted and syringing with a solution of bi chloride (1:5000) used. Later on Listerine was used.

The amount of discharge gradually lessened, and in order to hasten the progress of the case, Dr. James Bell opened up thoroughly the sinus on the face and removed, by means of a scoop, all carious bone. The cavity was packed with iodoform gauze and dressed from time to time. At the end of a month all had healed perfectly and patient had quite recovered.

CASE VI.—*Empyæma due to Dental Caries; Method of Examination.*—Mrs. McD., age 32, complained of a cough which had troubled her for past year; generally worse after having lain down for a short while, and unattended with any expectoration. For the past month has noticed a discharge from the right nostril which had an odour so disagreeable as to nauseate her. During this time suffered a good deal from neuralgic pain over the right eye and about the right side of nose; this pain is always increased by a cold in the head.

Careful rhinoscopic examination anteriorly reveals no purulent secretion about the right middle turbinate, but posteriorly a

considerable quantity is seen lodged on the floor of the inferior meatus and extending upwards to the posterior extremity of the middle turbinated bone on the same side. Transillumination shows dark area under right eye.

The right upper jaw reveals a small fistula opposite the second bicuspid, at the bottom of which carious bone is detected; root of tooth is still present; the gum on this side is decidedly hyperæmic; no tenderness on pressure.

Under ether, this root was extracted and entrance into antrum effected through original site of first molar. Syringing of antrum through this opening brought out a large amount of greenish coloured, thick, very fetid secretion.

Subsequent treatment was such as has been followed out in the foregoing cases, and the result has been the complete cessation of the cough and arrest of the discharge.

CASE VII.—*Empyema following Acute Rhinitis*.—Miss H., five days before date of consultation, suffered from a severe cold in head, followed two days later by left side of face becoming swollen and painful, the pain beginning at the left side of the nose and extending along the eye-brow of the same side; the eye on the affected side was inflamed and painful. The symptoms increased for two days, when on awakening in the morning found a bloody and fetid discharge coming from left nostril, and the intense pain and sense of fulness on that side of the face had entirely disappeared.

Examination of the nose showed a large collection of yellowish coloured secretion, tinged with blood, just at the anterior extremity of the left middle turbinated bone. There are no teeth they having been extracted some years ago. The mucous membrane on the alveolar process is markedly hyperæmic. Transillumination shows a dark area beneath left orbit.

The antrum was opened in the usual way and a moderate amount of very fetid discharge syringed out. Although it is only two weeks since the operation the discharge has ceased and the symptoms have all disappeared.

ADMINISTRATION OF CHLOROFORM AND THE DANGERS INCIDENT THERETO.*

BY J. D. BALFOUR, M.D., LONDON, ONT.

The object of such a discussion at this time is, as I apprehend, to keep men's minds alive to the dangers incident to the use of chloroform, and to see if by comparing experiences we may be able to assist each other in avoiding these dangers.

The safe administration of chloroform is to be determined by our knowledge of its action. This statement would imply on my part an attempt to enter into a scientific discussion of the physiological action of chloroform, but such is not my intention.

Having administered chloroform for nearly all the operations performed in the London General Hospital for the last six years, also for many special cases outside the hospital, as well as the use I have made of it in obstetric practice, I wish simply to give my experience with this anæsthetic from a clinical standpoint. What I have to say on this subject, therefore, will be arranged under two headings.

1. The dangers of chloroform, their causes and treatment.

2. How to avoid these dangers, *i.e.*, the best mode of administering chloroform.

For the sake of convenience we will speak of three stages in the administration of chloroform: (1) Excitement; (2) Complete anæsthesia or unconsciousness, and (3) Profound narcosis.

Dangers from the Lungs.—The first stage, or that of excitement, is the most dangerous, as more than half of the deaths from chloroform occur during this period before the operation is begun. One source of danger here is the liability of asphyxia from direct obstruction to the entrance of air into the lungs.

This condition may be caused by stertor, falling back of the tongue and depression of the epiglottis, spasm of the glottis, nasal obstruction, and also by the administrator in not allowing sufficient air to enter to maintain the respiratory movement.

By stertor here is not meant the ordinary palatine stertor of snoring, but a stertor caused by the vibration of the epiglot-

* Read at the meeting of the Canadian Medical Association, at Ottawa, Sept., 1892.

tidian folds which approximate so closely sometimes as to endanger life. This condition is recognized by the peculiar noise, the lividity of the patient's face, and from the fact that although the respiratory movements may continue no air is entering the lungs, as may be ascertained by placing the hand over the patient's mouth. I mention this cause of obstruction because I once saw it.

Falling back of the tongue and depression of the epiglottis is another form of direct obstruction to the entrance of air, one, however, easily recognized and somewhat frequent, occurring several times in my experience. Both these forms of obstruction are removed by turning the patient on the side and drawing forward the tongue, this operation relieving the stertor in the larynx and raising the tongue and epiglottis. Spasm of the glottis is another form of direct obstruction; here the patient's face becomes livid, convulsive movements ensue, the respiratory movements continue, but no air enters the lungs. When this condition is present the chloroform must be stopped at once, and if breathing does not take place directly, artificial respiration should be kept up until the patient is restored. If sufficient air be not allowed to enter the lungs with the chloroform, the chloroform itself becomes a direct obstructing agent and causes asphyxia by excluding the air.

The treatment for this condition is obvious, and it cannot occur except through gross carelessness or ignorance on the part of the administrator.

Of nasal obstruction I have no experience.

Dangers from the Heart in the First Stage.—By far the most important source of danger in this stage is the risk of an early, sudden and sometimes fatal syncope. Authorities differ widely as to its cause; some say that it is a reflex inhibitory action of the heart through the vagus, others that it is the direct action of the chloroform on the heart itself, others that it is caused indirectly by the heart sending impressions along the depressor nerve to the vago-constrictor centre, inhibiting its action; others that the excitement and shock of receiving the chloroform inhibits the vago-constrictor centre, while different theories are advanced by others.

It seems sometimes to be induced by the act of vomiting, and once I thought it due to the patient suddenly assuming an upright position. Whatever the cause, this much is certain, that the first effect of chloroform is to stimulate the higher nerve centres in the medulla, so that their functions are disturbed; they are intoxicated, so to speak, and while they are in this condition syncope is liable to occur.

Its advent is sudden, the face becomes pale, a few short shallow breaths, and the heart stops beating, although the respiratory movements may continue. It is, however, a comfort to know that syncope at this stage is not nearly so dangerous as when it occurs later on during returning consciousness.

If the patient's head be lowered, and artificial respiration at once resorted to, it will generally, some say always, restore the patient.

Nitrite of amyl is of service here, especially if the syncope be caused by a reflex inhibition of the heart.

As stated before, there is great danger as long as the stage of excitement lasts. Now, the stage of excitement will not cease until the reflexes are abolished, and as chloroform is given for the express purpose of paralysing these centres, clearly the safest method is to keep up a sufficient and continuous administration from the first until this effect is produced.

It is a dangerous procedure to remit chloroform in this stage. I would like to emphasize the statement that I hold the best way to administer chloroform in the first stage, is to commence cautiously, and then to continue with a hand neither timid nor reckless.

I have now mentioned some of the more important risks incurred during the first stage of the administration of chloroform.

We will now enter the second stage, that of complete anæsthesia or unconsciousness.

By this time perception and sensation are annulled, the patient sees nothing, hears nothing, and feels no pain, muscular tone is lost, and the voluntary muscles are paralysed, the limbs are limp, the pupil contracted and the conjunctiva insensible to touch, the face a little pale usually, the pulse probably a little slower than

normal, but regular, the respiration slow and somewhat heavy, the patient is completely anæsthetised.

If the chloroform is now continued without abatement dangerous symptoms will soon be seen. The pupil becomes suddenly fully dilated and fixed, the globes prominent, the respiratory movements, weak, irregular and sighing, the heart beats irregular and feeble, the face very pale; the commencement of these symptoms marks the beginning of the third stage, or that of profound narcosis.

I stated that the stage of excitement was the most dangerous period in the administration of chloroform. But almost equally dangerous, if unfortunately it becomes necessary to enter it, and sometimes it is necessary, is the stage of profound narcosis.

Now, between these two danger points is the comparative safety ground in which the surgeon must work, the stage of unconsciousness.

The amount of chloroform it takes to complete the second stage varies widely in different individuals, and a due appreciation of this fact will enable the administrator to proceed with comfort. For instance, if he finds the patient, after he is completely anæsthetised, can stand the continuous application of the chloroform, as in the first stage, without developing any dangerous signs, for a limited time, he can fairly make up his mind that he has a good subject to deal with.

It is clear, therefore, that the object of the administrator during the operation should be to avoid these two danger points; on the one hand not to allow the patient to so far recover as to allow the reflexes to operate, and on the other to be careful not to endanger the centres of respiration and circulation by too much chloroform.

But this is not always easily accomplished. I have given chloroform to patients, one in particular, in which there seemed to be little or no second stage of comparative safety; no sooner would the reflexes be abolished and the operator ready to proceed than alarming symptoms would show themselves. These are dangerous cases.

The best way, however, to guard against the first danger is to

frequently examine the eye, and any movement the patient may make, for symptoms of returning consciousness and reflex action.

If the pupil be contracted and the conjunctive insensible to touch there is generally no danger from this source. But remember, no single sign can be trusted. To prevent danger from the second source, the administrator should watch particularly the respiratory movements and observe the countenance, and I have no fault to find with those who look after the pulse too. Should respiration become weak, irregular or sighing, the countenance pallid, or the pulse irregular, rapid and feeble, the chloroform must be stopped at once. If during a prolonged operation signs of heart failure develop, anticipate danger by stopping the chloroform and completing the operation with ether.

Third Stage.—Notwithstanding all precautions, death sometimes occurs in this stage, and is then the result of direct paralysis of the centres of respiration and circulation, or both, by the chloroform. If from heart failure the face becomes very pale, the breathing weak, short and catching, the heart ceases to beat and the patient is in a state of syncope, and all this sometimes with little or no warning, what is to be done? Stop the chloroform, lower the patient's head immediately, and if the heart does not at once resume its functions, commence artificial respiration. Hypodermic injections of digitaline and strychnia is the best accessory treatment.

If asphyxia threatens, the face becomes livid, the respiratory movements irregular and spasmodic, convulsive movements are seen and the breathing stops, while the heart continues to beat flutteringly. Here again chloroform must be stopped and artificial respiration immediately resorted to, care being taken to keep the patient's head low. Digitalis and strychnia are also very important adjuncts in completing the patient's recovery. I have seen a touch of a battery excite breathing after artificial respiration had been kept up for some seconds.

In any case of imminent danger, whether the heart or lungs be at fault, the patient's head being immediately lowered, artificial respiration should at once be commenced by the best man present, and on no account should he allow anything to interfere

with his efforts until the emergency is passed. Additional aids, such as those already mentioned, should be practised by a second party. It seems to me however, that the majority of deaths that occur in this stage are attributable to the combined effects of the chloroform on both the circulatory and respiratory centres, and not to either one separately, because the depressed condition of the circulation or respiration caused by the chloroform each aggravate the other on account of their mutual dependence upon each other.

Suppose the operation over. There is still a dangerous period of returning consciousness, during which the reflex centres are recovering their normal condition, and the connection between the heart and the cardiac centre is being re-established. If death occurs now it will be from syncope, and is most likely caused by impressions sent by the now distressed heart along the depressor filament of the vagus to the vaso-constrictor centre inhibiting its action and causing it to release its hold on all the vascular areas.

This is a much more dangerous form of syncope than that which occurs in the first stage, because by this time the heart is weakened by the action of the chloroform and its own intrinsic ganglia, and when it does occur death is almost certain to ensue.

The methods for the treatment of syncope before indicated must, of course, be assiduously employed.

Before leaving the subject of danger I wish to refer to the classes of cases in which death ensues in one, two, three or more days after the operation.

I have seen two cases, one in particular where the patient appeared to be in good condition after the operation and everything indicated ultimate success, but the pulse became gradually weaker, more irregular and rapid, in spite of all treatment, until death occurred at the end of 36 hours. Is death to be charged to chloroform? Yes.

In one case in which a post-mortem was held it was undoubtedly caused by the chloroform. The case occurred in the practice of Dr. Eccles, London. Mrs. C., aged 48, abdominal section for ovarian tumor, a dermoid cyst. She had no alarming

symptoms until 12 hours after the operation, when she began to sink, apparently from heart failure, dying in 36 hours. Dr. McCallum, of London, made a post-mortem, and these are the notes: The wound and abdominal contents normal to the eye, peritoneum smooth and glistening, right side of heart contained an ante-mortem clot of one ounce, while the left side was empty, valves normal, all the chambers dilated, myocardium was pale and easily torn. The coronary arteries presented well marked nodular arteritis and the left was almost obliterated an inch from its origin. On throwing a section of the ventricular wall into water a coat of oil immediately floated on the surface. The microscope showed well marked fatty degeneration of the heart muscle. Is not this a case of a weak heart receiving the fatal strain from chloroform?

One very important quality of the heart is its elasticity, by means of which it is enabled to dilate when occasion requires and again resume its normal size when the emergency is passed. Now, a constant result of the administration of chloroform is dilatation of the heart, and it is clear that if its elasticity be impaired by any cause whatever, as by fatty degeneration, it may not be able to recover itself after the dilatation caused by the chloroform, and is consequently unable to sustain life long, although the patient may live through the operation.

If this be true, it follows therefore that a fatty heart or a weak dilated one is a contra-indication to the use of chloroform; the Hyderabad Commission to the contrary. But here a great clinical difficulty meets us, that is the almost impossibility of recognizing this condition of the heart beforehand.

I now come to the second heading, "Administration of Chloroform."

Preparation of the Patient.—It is a well-known fact that chloroform is best administered on an empty stomach. No solid food should therefore be allowed for five or six hours before the operation, but a cup of soup or broth may be given with advantage two or three hours before. If a weak heart be suspected, strychnia and digitalis should be given for a couple of days before the operation. This treatment was first suggested by Pro-

fessor Wood, of Philadelphia. The strychnia antidotes the chloroform and the digitalis tones up the heart. Other eminent authorities recommend alcohol before administering chloroform. Alcohol is not unlike chloroform in its physiological action, and the use of it is held to lessen the quantity of chloroform required. It is certainly of value in the case of habitual drunkards.

Suppose the patient now on the table. Don't commence the chloroform until everything and everybody is ready for the operation. If there is any waiting to be done let the operator do it. See that there are no false teeth in the mouth, nothing tight about the neck, chest or abdomen, don't allow two or three pillows, which is the usual request, place the head on a level with the trunk, or lower; this guards against syncope.

The patient may lie on the back or side, I prefer the side. This position allows the saliva and mucus to run out of the mouth instead of down the throat, and prevents the tongue from falling back. When the patient is under the influence of the anæsthetic he can be placed in any position the surgeon requires.

The slight struggling, which is sometimes seen, is no indication to stop the chloroform, some of the assistants can control the patient's movements. Vomiting is sometimes troublesome at this period. It is a reflex action, and the best cure for it is to push the chloroform until the vomiting centre is paralyzed. If it does occur, see that all solid particles are cleaned from the mouth and nostrils, and satisfy yourself that none has found its way into the trachea. Vomiting, however, often gives the most trouble after the operation, and numerous drugs and other expedients are employed for its relief. Every now and then some new remedy is announced for the certain cure of vomiting after chloroform, but this simply means that it has not been tried often enough. I know of nothing that can be relied on to relieve this very distressing symptom. If an opportunity offers during a prolonged operation I would allow the patient to approach consciousness, this tests his powers of reviving and rests the heart.

What about the quality of the chloroform to be used? The most practical way to dispose of this subject is to buy the best

recognized brand on the market. This is more satisfactory than trying to test it for yourself, and will stand you in better stead in a court of law.

The last point I will touch upon is in relation to the apparatus used in the administration, and I will at once state my preference for a Junker's Inhaler. This instrument is so arranged as to regulate the amount of chloroform taken at all times, it insures the admission of plenty of air and requires very little chloroform, it is a simple instrument, and would be safe in the hands of the most inexperienced; but any apparatus is dangerous if it leads the operator to think that by using it he may relax his personal attention to the patient.

In conclusion I would say that I consider everyone who administers chloroform should make himself aware of its dangers and should bear in mind the indications which announce these dangers. Every administration of chloroform is in itself a serious procedure and should only be undertaken with a feeling of responsibility, and with the consciousness that the life of the patient is in the hands of the administrator, and should occupy his constant and undivided attention.

An experienced and observant person will instinctively gather from numerous indications the approach of danger, and in the hands of such a person, the risks incident to the use of chloroform will be reduced to a minimum, but I do not believe that the danger factor can be wholly eliminated.

DISCUSSION.

DR. GRANT (acting chairman)—There is one point which has not been brought up to-day which is important in the administration of chloroform. Since the introduction of this agent by Professor Simpson, whom I knew well personally, we know the great advance that has been made in gynecological practice in the use of this material. I have been for many years using chloroform in obstetrical practice, and I wish to refer to one fact in connection with it, that is the cumulative effect of chloroform. For over twenty years I have steadily used it in practice, and the method I adopt is this—when the pains become strong and the case is well ad-

vanced, the patient herself, who is generally the individual to secure an ounce of chloroform, asks if something cannot be done to relieve her sufferings. When I suppose the case may be completed in an hour or two, I commence with the administration of a drop or two of chloroform administered on a common handkerchief. I continue this until I find a slight approach towards a narcotic effect. This will pass off and the woman will talk with you. I find by giving 20 or 25 drops of chloroform in that way, at the conclusion of the case the woman goes into a profound sleep, and is delivered without any difficulty whatever. In the last week I had occasion in two extremely difficult cases to use chloroform and the forceps. I administered the chloroform by the drop method, keeping it up, and at the last moment giving about half a teaspoonful. The woman went into a profound sleep and I used the forceps without the knowledge of the patient at all. I do not approve of the administration of chloroform only at the last moment. I have a considerable amount of obstetrical practice, and I have very great pleasure indeed in mentioning this fact to-day, because I am positive there is no medicinal agent administered, not even digitalis, which has more cumulative effect than has chloroform, given in that way. It is important that those who may not have done so will in their practice test the fact, and I am sure you will do it with great satisfaction to yourselves and to your patient.

DR. McLEAN—At the risk of being considered talkative, I should like to say one or two words on this subject. I was taught to believe in chloroform by Simpson, and I am sure anyone who has had the privilege of listening to his eloquent, ingenious and forcible lectures could not fail to have a strong impression made upon his mind. That was the case with myself, and the consequence is that I have stood up for chloroform from that day to this, and I have always used it in surgery, and midwifery also when I used to practice in that line.

It was a very excellent, valuable and practical paper, but there are one or two thoughts recalled to my mind by the paper from my own experience. There is a class of cases not referred to by the author of the paper, and that is those cases which die before they get any chloroform at all. It is not such a very uncommon class. There are one or two cases of

that kind that are historical. There is a case recorded by Simpson. An appointment was made in the Royal Infirmary to perform an amputation, but owing to Mr. Simpson's enforced absence the anæsthetic was not used and the patient died before the operation commenced. I had in my own experience a similar case. I was asked by a brother doctor to see a patient with an abdominal tumour. I went to her house with the doctor and found a very fine, healthy, vigorous Scotch lady, who had come a little distance by rail for the purpose of having an examination made. She lay down on the sofa and the examination did not take nearly as long as it has taken me to tell it, because it was exceedingly simple, involving no vaginal examination, no anæsthetics or instruments. I simply passed my hands over the abdominal walls. I said: "You have a favorable case for operation and your best plan is to go home and make arrangements to have the operation done." The doctor said: "I have never done such an operation and I wish you would stand by me and see me through it." About an hour afterwards the doctor came and said: "I have changed my mind—it is a serious case and I will let you operate." I said: "I do not think it." He said: "Doctor, she is dead." He said we had not come a block from the house when she turned over on the sofa and died. Unfortunately no post-mortem examination could be had, and we do not know even now the cause. I mention these cases to impress the fact, as I have had occasion to do in court and elsewhere, that patients die suddenly who do not have any chloroform, and because they sometimes happen to die on the table under chloroform it is not fair or just to say that it is always caused by the chloroform. I had occasion to write to the daily papers on account of excitement on that subject over a death that occurred in Detroit and which led to some threats being uttered. I contributed a brief article to the papers pointing out these facts and stating, with all reverence, that the patients die by the visitation of God. We cannot tell whether it is the chloroform or not. Once more, there is a class of cases in which I think chloroform or any anæsthetic is dangerous, and that is operations about the rectum, ligaturing or cutting off hæmorrhoids. Often it is dangerous in an operation for fistula. There seems to be some direct relation, perhaps,

through various nerves, with important organs, I may say vital organs, that are involved in this class of cases. I have had more frights in the administration of chloroform in operations about the rectum than in any other part of the body. You ligature a hæmorrhoid and draw it tight, but you must watch the patient's face. There is a peculiar shock; even when the patient is under the influence of chloroform and feels no pain at all I have repeatedly seen danger. A few months ago I had to appear in the witness box in the case of a brother doctor who was sued for heavy damages for the death of a patient supposed to die from the effects of chloroform in a simple operation for hæmorrhoids. I think it is an important and practical point to make, when you consider how in other operations the patient pulls through. Take abdominal operations. I have myself plowed around the abdominal cavity for three hours and had no danger or trouble at all. The patient slept quietly and peacefully all the way through. No such alarming symptoms as occurred from the simple operation of cutting off an external hæmorrhoid or ligaturing an internal one were visible.

The method of administering chloroform suggested by the writer of the paper is an excellent one. My own preference is for that arrangement known as Es-march's inhaler—that little simple inhaler—a little piece of cotton over a small wire frame, so that you can drop the chloroform drop by drop. It is very economical so far as the chloroform is concerned, and a very safe way to administer it. I have settled down finally to that and would be loth to change to any other method. But over and above all that, I have one more remark I wish to make, and that is that I think the war between ether on the one hand and chloroform on the other, has not been carried on scientifically. Ether was first used as an anæsthetic on this side of the Atlantic in Boston, and naturally there is a great preference for it there. In some other directions also, on the supposition that it is safer, a claim has been made in favour of ether. Now it may be safer—I am not sure of it. I think when it is all summed up, when as many patients have had ether as have had chloroform, there will be found to have been as many catastrophes on the one side as on the other. Then there are such advantages in chloroform in an-

other respect. Just the day before yesterday I went with a member of this Association to an operation where ether was used. We all got tired before the patient was anaesthetised and were afraid of missing our train. Finally half an ounce of chloroform was found in the company and it was used and the operation was over in a short time. Whether there are any disadvantages in it or not I am not sure. I have been giving chloroform now for over thirty years, and I have never yet seen a death from chloroform. I am sorry to say I have seen my patient die on the table, but it was from hæmorrhage, or shock, or some prolonged operation, but never in a case in which I could really attribute the disaster to chloroform. I do not say that in a boastful spirit—far from it. I know it is a thing which may happen at any time to any person, but I tell it as a matter of fact; I have been giving chloroform largely and continuously in all sorts of cases for thirty years and never yet have I seen an accident. I think something does depend on the way it is administered, and at all events we should recognize that there is danger in it and never give it carelessly. After a man has got into the way of operating and all goes off smoothly, he hardly allows himself to think of the possibility of a catastrophe; that is the very time he should be on the look-out. He may omit some precaution and fail to arrest death. When danger is threatened, it may be obviated by careful precautions or active interference, but there are other cases I am aware of where the patient dies and nothing can be done, and I do not think there is any blame to be attached to the surgeon who administers chloroform under those circumstances. It comes under the verdict which I have already indicated.

DR. HILL (Ottawa)—These conversations are very interesting and also instructive. As a hospital surgeon of some thirty years standing I may be permitted to state the result of my experience. I am happy to say that I have had only one death where chloroform was used. It was the case of a female, the wife of one of the privates of the 60th Rifles. I was not the operator; I was invited by the surgeon to assist in the operation, in company with the late Dr. Beaubien. I took charge of the chloroform administration and I administered about two drachms. My practice is to take a towel and

make a cone of it, sometimes with a piece of sponge in it. In this case to which I have referred I certainly did not use more than two drachms of chloroform. We know how rapidly chloroform evaporates, and therefore I do not think I gave more than one drachm. However, when the operation was entirely over I saw an extremely queer movement; I thought the patient's head was in a bad position and I got a pillow and put it under her head. However, she made an effort to vomit, turned over on her side, and when we looked she was dead.

DR. McLAREN—With regard to the point made by Sir James Grant, as to the cumulative effect of chloroform, I am thoroughly in accord with his views on the subject. I think chloroform can be administered easily in that way. At first a considerable quantity is required, but afterwards very little will suffice. The method of giving it in obstetrics, as Sir James Grant has described, seems to me to leave very little to be desired. I am convinced of the cumulative effect of chloroform.

DR. BALFOUR—I did not pretend to give anything like an exhaustive statement of the dangers attending the administration of chloroform. I have probably administered it over nine hundred times, and I have given the results of my experience as well as I could. I can agree with what the acting chairman has said as to the use of chloroform in obstetrics. For the last six years that branch of practice in our hospital has been altogether under myself. With regard to the comparison between chloroform and ether, I may say that I have had no experience with ether. It is a subject that practical men must speak of with more authority than mere scientists. I am of opinion that chloroform can be administered with as much safety as ether. However, I have never used ether and I cannot speak of it from a practical standpoint. In conclusion I wish to state that I feel highly flattered with the manner in which this paper has been received by the Association.

SIR JAMES GRANT (Acting Chairman)—We are all interested in this subject inasmuch as we know perfectly well that death from chloroform might happen even with the most experienced physician, and it is well that we should have all the facts that can be brought out on a subject like this placed succinctly before us as they have been to-day.

Retrospect Department.

QUARTERLY RETROSPECT OF SURGERY.

BY FRANCIS J. SHEPHERD, M.D., C.M., M.R.C.S., ENG.

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

New Operations for the Radical Cure of Hernia.—Every month brings forth a new batch of operations for the radical cure of hernia, each new operation, if we may take the word of its inventor, the most perfect and satisfactory yet produced, and giving none of those frequent relapses which so often follow other operations. The ingenuity displayed by some surgeons in endeavouring to modify or improve on old operations is amusing; each one wishes to have an operation named after himself, and have a little ephemeral notoriety. It has always been the way, and will, I have no doubt, continue so to the end. Time will sift the grain from the chaff, and those who have really added a valuable operation to surgery will not be forgotten, whilst the others in a few years' time will be as if they never were.

Salzer of Utrecht (*Centralblatt f. Chir.*, Aug. 20, 1892) describes a new method of radical cure of large femoral herniæ. In small herniæ, excision of the sac with ligature of its neck has proved fairly successful, but when the hernia is larger than a hen's egg this simple procedure is more likely to be followed by speedy recurrence than by an abiding cure. In cases of large femoral herniæ, Salzer objects to any attempt to bring together the margins of the ring by suture, as the resistance of the fibrous structures of the ring would very probably cause local gangrene and sloughing. The plan of closing the canal by cicatricial tissue, either by removing its fatty and glandular contents or by inserting foreign material, is also open to objection, as the new tissue thus produced is apt to become absorbed. Salzer's method consists in first removing the sac and then closing the external orifice by a flap formed by the fascia covering the pectineus muscle. This flap, the free convex margin of which is divided downwards whilst its upper portion remains attached to the muscle, is turned upwards and fixed by sutures

to the middle third of Poupart's ligament. In this way the septum crurale is replaced by a tough and resistant layer of fibrous tissue. The thickness of the pectineal fascia varies in different subjects, but the membrane is most likely to be found sufficiently resistant in old persons and those who have for a long time worn a truss.—(Quoted from *Supplement to British Medical Journal*, Oct. 1st, 1892.)

Mr. Watson Cheyne (*Lancet*, Nov. 5th, 1892) describes a somewhat similar method for the radical cure of femoral hernia, only he rejects the pectineal fascia as being too weak and thin for the purpose of forming a flap, and, instead, turns up a flap of the pectineus muscle itself. His plan of operating is as follows: After the hernia has been reduced, the neck of the sac is ligatured and stitched to the abdominal wall; a flap is then mapped out in the pectineus muscle of sufficient size to fill up the crural canal without any tension and including the whole thickness of the muscle. The incision in the muscle begins at the inner wall of the crural canal, runs for a short distance parallel to Poupart's ligament, and then curves downwards, outwards and upwards. At the two lowest angles of the flap, stitches are passed and tied so as to get a good hold of the muscle. The flap is then peeled off from the bone and the stitches are passed through the abdominal wall above Poupart's ligament. The result is that the femoral canal is completely filled up with a thick mass of muscle which soon unites to the sides of the canal, and although its muscular elements may atrophy, a dense mass of fibrous tissue will be left behind. Mr. Cheyne makes use of Chinese silk stitches. He has operated in two cases, with, so far, perfect results. The region of the crural canal remains a hard mass, without the slightest impulse on coughing, and the patient does not wear a truss.

Professor Theo. Kocher, of Berne (*Correspondenzblatt für Schweizer, Aertze*, 1892, and *Annals of Surgery*, Dec., 1892) publishes an elaborate article reviewing the various operations already established for the cure of inguinal hernia (e.g., Maccwen's, Barker's, Ball's, Bassini's), and describes an operation of his own. An incision is made in the direction

of Poupart's ligament and a little above it, through the skin and superficial fascia. The superficial epigastric artery is tied; next the intercolumnar fascia covering the external abdominal ring is divided with the cremasteric and the infundibuliform fascia. The spermatic cord is now separated and lifted up, and one can recognize the thin edge of the hernial sac; this latter is carefully separated from the cord and surrounding structures, then forcibly pulled out and its pedicle exposed. The index finger of the left hand should then be introduced into the spermatic canal through the external abdominal ring, and opposite the internal ring a small opening should be made through the aponeurosis of the external abdominal oblique and the underlying fibres of the internal oblique and transversalis. Through this opening a pair of artery forceps should be pushed and made to traverse the spermatic canal, coming out at the external ring; here they should be made to seize the bottom of the dependent sac and the sac should be pulled through the canal and pulled out through the opening made opposite the internal ring and drawn out as much as possible. Now this sac should be twisted after Ball's method of torsion. After it has been twisted up tightly it should not be removed, but strongly drawn down and laid along the outer surface of the external abdominal oblique, in the direction of the spermatic canal, and there firmly fixed by sutures; a groove for the lodgment of the twisted sac is made by the tension and through the upper wall of the groove sutures are passed which include the internal oblique and transversalis as well as the aponeurosis of the external oblique, and after going through the twisted sac itself is made to go beneath Poupart's ligament. Five to seven of these sutures are passed, the lower ones approximating the pillars of the external ring, and tied. Any of the sac that projects beyond the external ring is cut off. In this way the canal is closed and the sac acts as a solid pad through the whole length of the canal. the peritoneum being put on the stretch laterally, and pressed firmly against the abdominal wall at the site of the internal inguinal ring. The operation is more certain when the upper suture can be deeply applied laterally from the point where the spermatic cord enters the abdominal wall.

Prof. Kocher employš the same method in cases of femoral hernia. The sac having been completely isolated and twisted as strongly as possible, is drawn through a small opening above Poupart's ligament and treated as in inguinal hernia. The sutures are passed through the pectineal fascia and Poupart's ligament, and in this way the femoral ring is closed. In Professor Kocher's clinic 119 cases of hernia have been operated on from 1885 to 1891; of these, 94 were traced and gave the result of a recurrence in 20 per cent. In some of the cases of recurrence he himself did not operate; in others only the external ring was sutured. The average was 23 days in hospital in the eight cases where suppuration took place, the rest were allowed up in 7½ days. Prof. Kocher thinks that if some of the patients could have remained, as Macewen recommends, six weeks in bed the results would have been better, but on account of limited hospital space such an extension of time was impossible. The author states that he carried too far the non-wearing of trusses after operation, and thinks that in those who are the subject of multiple herniæ trusses should be worn. He says the first of the conditions necessary for the obtaining of a positive radical cure is perfect asepsis. The second condition is high ligation of the neck of the sac, and the third condition necessary to a good result is the closing of the hernial canal. If all these conditions are fulfilled a radical cure results. Certainly the results obtained by this operation appear brilliant, but the time that has elapsed since the performance of the operations has not been given. In certain cases where the sac is very thin, the difficulty of treating it as described above seems to me not without difficulty, and, again, the method of treating the congenital cases is not dealt with.

Prof. Kocher is a brilliant and original surgeon, and anything coming from his pen should be treated with respect. I have no doubt his method will have a fair and full trial on this side of the Atlantic, where no method has as yet completely satisfied surgeons as being the ideal one.

Treatment of Gangrenous Hernia. — When strangulated hernia is gangrenous, Dr. T. Rousing of Copenhagen (*Centralblatt f. Chirurgie*, July 16th, 1892) pulls forward the suspicious

loop of bowel and sutures it to the abdominal wall. The sutures should be of catgut and silk, and should only include the serous layer of the bowel. The parts should then be dressed with sterilized gauze, and you should wait for developments. Should the loop return to its normal condition, replace it; when, however, it is gangrenous, either resect the bowel or establish an artificial anus.

Poulsen of Copenhagen (*Centralblatt f. Chirurgie*, No. 30, 1892) long ago advocated the establishment of an artificial anus instead of resection in gangrenous herniæ, and he still adheres to the treatment. After opening and irrigating the hernial sac, the incision in the abdominal wall is enlarged, the bowel drawn out, and sutured to the abdominal wall. Should perforation occur, close the exposed part with artery forceps and wrap in iodoform gauze. After one or two days the loop is destroyed by the thermo-cautery, the enterotome used, and enteroplasty performed. Three out of five cases treated by this method recovered.

Jules Marin of Paris, in a paper on the subject, describes a procedure proposed by Chaput and Deschamp, the essential point of which is the immediate removal of the spur resulting from an artificial anus by primary longitudinal splitting and subsequent suturing. After circular resection of the gangrenous portion, with or without cuneiform excision of mesentery, both free ends of the divided bowel are placed side by side. In each a longitudinal incision of from 6 to 8 cm. is made 1 to 2 cm. distant from the insertion of the mesentery. The four edges of the two longitudinal splits in the intestine are sutured, so that both lumina of the bowel freely communicate. After this suturing the two ends of the bowel form a condition of a pair of trousers, whose common upper broad opening still requires closing. This closure may be complete, or a small opening may be left as a safety valve, and its edges sutured to the hernial sac. (*Quoted in Annals of Surgery*, January, 1873.)

Dr. Ransohoff, of Cincinnati, in an article on the *Treatment of Gangrenous Hernia* (*Annals of Surgery*, October, 1892) reviews the literature of the subject. He reports four cases

with two recoveries. In one of the fatal cases there was gangrenous omentum, but no intestine, in the sac. The omentum was tied off but patient died of peritonitis twenty-four hours after. The second case was a very large femoral hernia in a woman aged 69. It was not operated on, taxis being apparently successful. Patient died next day. At the autopsy there was a localized gangrene with perforation. The third case was a female aged 30, with a femoral hernia strangulated four days. At the operation a suspicious patch was seen in a portion of the ileum and the gut was returned with trepidation and held in place with cat-gut sutures, the wound being packed with iodoform gauze. Perforation occurred on the fifth day and a fecal fistula was the result. This, however, closed spontaneously in about a month. The fourth case, a female with large inguinal hernia. On operation the gut was found gangrenous and fourteen inches were removed. The two ends of bowel were then sutured together with a continuous Lembert. The operation took fifty minutes and the patient recovered without a bad symptom, and when last heard from, nine months after the operation, was quite well.

Operative Treatment of Diaphragmatic Hernia—Swartz and Rochard (*Revue de Chirurgie*, September, 1892), in a paper based on a fatal case of strangulated diaphragmatic hernia, discuss the surgical treatment of this affection. The diagnosis of this lesion is extremely difficult and even laparotomy does not always discover it. In most cases it is very difficult and in some cases impossible to reach the seat of the hernia so as to be able, by relieving the strangulation, to drag the strangulated intestine downwards into the abdominal cavity. Radical cure also, even if the strangulation be relieved, is rarely possible, and thus the return of the hernia is likely. The authors recommend dealing with the hernia by a transpleural method of operation as follows: After the pleural cavity has been opened by a free incision and the removal of a portion of the ninth and also the tenth rib, the hernia is exposed and can be manipulated as readily as any form of external strangulated hernia. The constricting ring may be incised, the

sac opened and, together with its contents, carefully cleaned and every precaution observed to prevent peritoneal infection. Inflamed omentum and gangrenous bowel may be resected. To get a radical cure the sac should be excised, the edges of the opening in the diaphragm freshened and brought together by sutures, including muscular structures and pleura. It is advised that the exploratory laparotomy wound should be left open until the completion of the transpleural operation. In this way the pneumo-thorax soon disappears. Posternski and other Italian surgeons have performed the transpleural operation with success in cases of omental diaphragmatic hernia of traumatic origin (quoted in *Epitome of Brit. Med. Jour.*, November 5, 1892).

Mr. Henry O'Hara, of Melbourne, Australia, describes a *New Method for the Radical Cure of Hernia*, which he has carried out in no less than sixty cases (*Brit. Med. Jour.*, December 10, 1892). The operation is as follows: Having freed the vas-deferens, a long, strong carbolized gut or sterilized silk suture is tied around the neck of the sac; a second suture of finer material is placed about a quarter of an inch lower down and the neck of the sac divided between the two. He then introduces the index finger of his left hand as far as possible up the inguinal canal, anterior to the peritoneum, and having satisfied himself that no important structures lie between the tip of his finger and the abdominal parietes, he makes an incision—through the skin only—from without at a point corresponding with the tip of the finger on the inside. This is the point he selects for fixing the stump, which is in most cases from 2 to 2½ inches above the internal abdominal ring. A guarded needle threaded with one of the long sutures attached to the neck of sac is now passed up the canal on the finger to the point selected for fixing the stump and driven through the parietes. The needle having been unthreaded is withdrawn to be threaded again with the other end of the ligature, and is re-introduced up the canal and brought out at a little distance from the first. The two ligatures are then firmly tied, the ends cut off and the sac thus secured. A decalcified bone drain is now introduced into

the canal and the margins are laced together over it with silk-worm gut ligatures. The superficial wound is brought together with horse-hair, and over all an antiseptic pad with a spica bandage. The plastic inflammation caused by this procedure brings about a sufficient narrowing of the canal to prevent recurrence of the hernia.

SURGERY OF THE RECTUM.

Extirpation of Rectum.—Shelkly, of Utrecht (*Berlin Klin. Woch.*, August 8, 1892) describes a new method of extirpation of the rectum. The patient is placed in the lithotomy position, the buttocks brought to the edge of the operating table and raised so that the intestines may fall back into the abdominal cavity. An incision is then made commencing at the inner margin of the right ischial tuberosity and carried over the coccyx to the left ischial tuberosity. The coccygeal attachment of the sphincter ani is next divided close to the bone. With the left forefinger the connective tissue is separated, and with a pair of scissors the levator ani muscle is divided, first to the left then to the right, as far as the limits of the skin incision. The posterior wall of the rectum, at this stage of the operation, usually appears in the bottom of the wound. If it be necessary to expose the pelvic organs, the coccyx should be divided by a transverse incision. The part of the rectum to be removed is next separated and cut across transversely just above the external sphincter. The rectum is seized with forceps and separated until the upper limit of the disease has been passed. In cases of carcinoma which extend high up, it is necessary to open Douglas's pouch. Afterwards the rectum is brought down and sutured to the lower segment. Shelkly has operated in this way five times, three cases of carcinoma, one syphilitic stricture and one atresia of the rectum; all recovered. In a sixth case a carcinomatous tumor was removed from the middle of the sigmoid flexure, together with part of the meso-colon. The part of the sigmoid flexure above was brought down and sutured to the end of the rectum. The patient died three weeks after operation. In the seventh case two and a half inches of the rectum were removed, Douglas's pouch opened

and an ovarian cyst and Fallopian tube removed. The pedicle was dropped back and the aperture closed with silk sutures. The patient made a good recovery, and five months afterwards had no sign of recurrence. In the eighth case the patient, with carcinoma of the rectum, died two days after operation. (Quoted in epitome *Brit. Med. Jour.*, October 8, 1893.)

Excision of Cancer of Rectum, with Selection of Cases—Mr. Harrison Cripps says that according to his researches into the pathology of rectal cancer (*Brit. Med. Jour.*, December 10, 1892), there is only one form of the disease, adenoid carcinoma, yet clinically the growths have very different features, because in some cases the disease grows more rapidly than in others. So long as the growth has not perforated the muscular coats, the prospects of an operation are hopeful; but on the other hand, when it has once extended beyond the bowel the prognosis becomes most unfavorable. Before advising operation the surgeon should assure himself that there is no general infection, that the lumbar glands and liver are not affected, although usually these structures are not implicated until late in the disease, still in some cases there is early infection of these structures, whilst the local disease is quite insignificant; this most often occurs in younger patients. For purposes of examination the finger is the proper instrument, and ether should be given in doubtful cases. Other cases where operation seems inadvisable without ether, under it the muscles relax, the growth becomes moveable, and the case appears to be quite suitable for operation. After describing cases suitable and unsuitable for operation, and also the appearance and clinical features of cancer of the rectum, Mr. Cripps goes on to say that during the last 15 years he has examined upwards of 400 cases of cancer of the rectum, and in about half he advised against operation either by excision or colotomy. In the remainder of the cases operative interference was urgently advised. In many the advice was not followed, but in 114 cases Mr. Cripps operated 38 by excision and 76 by colotomy. Of the 38 cases of excision 3 died, 35 recovered; mortality less than 8 per cent. Seven of these cases were lost sight of, in 10 the growth

recurred within one year, five between the first and third years, one died a year after without recurrence, and one had no recurrence after eighteen months. In 11 no recurrence one to twelve years. In seven of these three years had elapsed since operation. The great trouble after operation is the tendency to contraction. This can be avoided by proper treatment of the wound during the healing process. By introducing into the bowel a full sized rectal bougie 1 5-16 of an inch in diameter, this complication may be avoided. The introduction should commence at the end of a fortnight, the bougie should be allowed to remain in some hours daily for a month. The patient should then pass the bougie daily for a year or longer. The tendency to contraction seems gradually to disappear and gives little trouble after the second year. In three cases the recurring disease was successfully removed and the patients did well.

In a paper on *The Choice between Extirpation and Colotomy in Cancer of the Rectum*, Dr. Chas. Kelsey, of New York, comes to the following conclusions (*New York Medical Journal*, November 12, 1892):—

1. The operation of excision of cancer of the rectum has a very limited range of application.
2. Kraske's incision, though enlarging the scope of the operation, has, on the whole, in no way improved the results.
3. In colotomy we have a method of treatment almost free from risk, and one that in any considerable number of cases will give a longer length of comfortable life.
4. Extirpation is more often indicated in non-malignant than in malignant stricture, but even here the advantages over colotomy are not sufficient to justify the increased risk in graver cases requiring extensive operation.

Resection of the Entire Ilium. Nelaton (*Revue d'Orthopédie*, No. 5, 1892) reports a case in which the whole ilium was invaded by caseous fungous masses. The entire bone was removed after the separation of the internal periosteum by a division through the ilio-sacral joint, the horizontal ramus of the pubis and the posterior superior portion of the acetabulum. There was no involvement of the joint, and after thorough

curetting, drainage and antisept treatment, the patient made a good recovery. A new fibrou articulation formed in a position corresponding to the external iliac fossa ; there was shortening, but the use of a high shoe and cane enabled the patient to walk moderate distances. The author reports the case as a pathological curiosity, and to show that with less than one ilium it is possible for a patient to walk easily and well. (Quoted in *Amer. Jour., Med. Sc.*, January, 1893, No. 1.)

Suture of the Spinal Cord.—Chipault (*Revue Chir.*, August, 1892) criticises the proposal made by Maydl and others, that in cases of old division of cord, or of its functional destruction over a certain extent from schlerosis, two fresh and healthy surfaces made by clean section might be brought together and maintained in contact by sutures. In these two categories of cases the author holds that such treatment is anatomically impossible. In three subjects examined after death from fractures of the spine, it was found that the retraction of the medullary segments and the extent of the schlerosis necessitated free resection, and that the inelasticity of the cord and the resistance of the ligaments formed by the pia mater prevented apposition of the cut surfaces. On the other hand, in cases of recent division of the cord by a cutting instrument in which it is not necessary to practice medullary resection, suture of the cord, or, strictly speaking, suture of its sheath of pia mater is possible in the cadaver and very probably would be found so in the living subject. After describing the method of suture with fine silk, he says, that it often happens that one or more nerve roots are found divided, together with the cord, especially at the lumbar swelling along which the nerves forming budles take a parallel course. It would always be possible in such cases to suture the peripheral ends of the divided nerve either to its central end or to the intact nerve root corresponding to a portion of the cord placed below the injury. (Quoted in *Epitome of Brit. Med. Jour.*, September 24, 1892.)

The Aseptic Treatment of Wounds.—Neuber, of Kiel, in a clinical lecture (*Archiv. fur Klin. Chir.*, Bd. xlv, Hft. ii) on wound treatment says that during an operation there should be

no irrigation of the wound, and only once, immediately before the insertion of the sutures, should the wound be washed with a 0.6 p.c. of salt solution. No drainage is used and the wound is immediately closed completely. With the exception of a sponge enveloped in sterilized gauze, no antiseptic or sterilized dressings are employed. The latest developments of the author's methods are as follows: The whole wound is loosely filled with moist sterilized gauze in long strips two-thirds of an inch wide; all ravellings are to be removed before use. If surgical tuberculoses are under treatment iodoform gauze is used; over this gauze the lips of the wound are laid and carefully united by suture, except a small cleft at either end of the line of union. One end of the gauze strip is brought out of this opening. While an assistant compresses the parts with sponges enveloped in sterilized gauze, the operator carefully withdraws the strip by pulling on its projecting end. On the removal of the gauze the remaining opening is closed by sutures which have already been inserted but have remained untied. Compression with sponges is then made and this drives out any remaining air and blood, and they are then retained in place by a bandage. Over these sponges, cotton and splints may be applied. If any filament of gauze remains behind in the wound it will not give rise to any reaction nor interfere with healing. (Quoted in *Univ. Med. Mag.*, January, 1893.)

Hernial Protrusion of a Ureter in the Inguinal Canal—Reichel reports the case of a boy (*Archiv. für Klin. Chir.*, Bd. XXIV, Hft. 2, p. 431), seven and a half years old, who for four and a half years had presented a tumour in the right inguinal region, extending into the scrotum, increased by cough and disappearing when the recumbent position was assumed. For four years a truss had been worn; the tumor, nevertheless, had progressively increased in size. The mass was longitudinally oval and about as large as a hen's egg. It was readily though not entirely removed by taxis, a small hemispherical mass, perhaps as large as a hazelnut and of soft consistence, remaining unreduced. The finger readily passed through the inguinal canal into the abdominal cavity. The columns of the

canal and the abdominal walls were relaxed. Both testicles were present in the scrotum, the right appearing adherent to the hernial sac and moved slightly upwards when the tumor was reduced. Herniotomy was performed and it was found that the swelling was caused by a dilated and tortuous ureter, narrowed below by a stricture and communicating above with a hydronephrotic sac. The tube was divided, its lower portion being ligated, whilst it was sutured in place, so that a ureteral fistula remained. Subsequently the rest of the ureter and the kidney of that side was removed. The extirpated sac had a capacity of about two quarts; it was surrounded by a layer of healthy renal tissue three-quarters of an inch thick. It was thought that at some previous period ulceration of the ureter had taken place, as the result of the presence of a calculus, and that this caused cicatricial narrowing and the secondary development of the hydronephrosis. (Quoted in *Philad. Medical News*, October 15, 1892.)

Treatment of Malignant Tumors by Repeated Inoculations of Erysipelas—Dr. W. B. Coley, at the meeting of the Section of Surgery of the New York Academy of Medicine, held December 20, 1892, read a paper having the above title (*New York Med. Record*, January 14, 1893). He reported ten cases. He had been stimulated to try this method by a case which had occurred in the New York Hospital, and on which several operations had been performed by Dr. Bull, always, however, with recurrence or extension, until accidentally the wound became inoculated with erysipelas, after which it healed and there had since been no return, although seven years had elapsed. The first case in which he had an opportunity to try artificial erysipelas was one of sarcoma of the neck, which had been operated on by Dr. Bull without, however, being able to remove the whole disease. It almost completely blocked up the pharynx. Dr. Coley injected small quantities of erysipelas bouillon cultures into the wound. Slight local and constitutional reaction followed, and the tumor of the neck perceptibly diminished in size. Within a few months the tumor had reached its original size and a fresh culture was injected, this time into the

tumor. An active erysipelalous eruption with constitutional disturbance ensued, the eruption extending over the head and face. In two days the tumor on the neck began to break down and discharge freely and in two weeks had almost entirely disappeared. The appetite improved and there was rapid gain in health and strength. The local trouble was no longer of significance, and up to the present time there has been no return. The patient, however, was addicted to the morphine habit, which he still continued. In the next two cases he failed to get the erysipelas to take. The fourth case was one of sarcoma of the back and groin. After several attempts at inoculation he finally succeeded in inducing an attack, the tumor shrank, became pale, and in three weeks disappeared, leaving scarcely any induration and rapidly gained flesh. After several months there was a recurrence, and in July last he again succeeded in inducing erysipelas and again the tumors disappeared. There was at present another recurrence. The seventh case was one of carcinoma of the breast, of five years standing, and on which four operations had been performed. The inoculations were made in August last with temporary benefit, but there has since been an increase in the size of the tumor. The ninth and tenth cases were likewise carcinomatous, one effecting the cervical and the other the inguinal glands. They had improved under the erysipelas treatment. With his own cases the total number found by the author in which erysipelas had become either accidentally or intentionally engrafted upon malignant tumors was 38, 17 of which were known to have been carcinoma and 17 sarcoma. The immediate result in 17 cases of carcinoma was a permanent cure of three, 10 showed temporary improvement and one died as the result of the erysipelas on the fourth day. Of the 17 cases of sarcoma seven were well at periods from one to six years after the attack of erysipelas, 11 showed more or less marked improvement, and one died. The author thinks that the cure has been effected by an antagonistic bacterial action. According to recent experiments it would seem that the effect of this treatment is not merely local in its action, but sometimes constitutional, causing the disappearance of tumors

at a distance from the inoculations. Dr. Coley's experience is very instructive and gives us some ray of hope, even in the most hopeless cases, viz., those of sarcoma of the neck. I might add another case of benefit derived from erysipelas to those already cited. Some six years ago a patient had an epithelioma on his lip which was removed by some "cancer specialist" in the country with plasters. The man remained well for two years, when his submaxillary glands on the right side became affected and the right side of the lower jaw. He was operated on by me, and the right side of his lower jaw was removed with the floor of mouth and submaxillary glands. He rapidly recovered, but the disease soon returned in the remaining half of the jaw, and within a year he re-entered the hospital and I removed the left side of the jaw with a lot of infiltrated tissue about the submaxillary region. After a few days he contracted a severe attack of erysipelas, from which he recovered rapidly. He went out well and has remained well now nearly three years.

The Treatment of Cicatricial Stenoses of the Œsophagus.—

Dr. Willy Meyer reports two cases of stricture of the œsophagus which were operated on (*N. Y. Med. Jour.*, November 19, 1892) and after discussing the subject, comes to the following conclusions:

1. After swallowing acids, &c., sounding should be begun as soon as the internal wounds have healed, certainly not later than four weeks after the accident.

2. If a stricture of the œsophagus has been developed, and is impermeable from the mouth, the patient should be submitted to an operation as early as possible. No forcible dilatation should be permitted for fear of injury to or perforation of the œsophagus.

3. External œsophagotomy for the establishment of a temporary fistula of the neck, will be found useful and sufficient in many cases, especially in children, as from this point the stricture can be easily passed and a tube left in situ. This proceeding is always indicated in multiple strictures.

4. In grown persons, and those who are emaciated and require immediate nutrition, primary gastrostomy, with subsequent retrograde sounding, may be preferable.

5. If the stricture has been successfully dilated, or if the same sound which passed in through the wound on the neck can also be pushed down through the mouth, the fistula must be closed. If gastrostomy has been performed then a special operation for closing the gastric fistula must be undertaken.

6. In a number of cases there is a limit to the amount of dilatation, or, again, the stricture rapidly contracts; and in these cases internal œsophagotomy is the only means of cure.

7. Internal œsophagotomy, if performed under these circumstances, is a very dangerous operation, chiefly because the wound cannot be kept aseptic.

8. A thorough disinfection of the intrathoracic portion of the œsophagus seems feasible by first adding gastrostomy to external œsophagotomy and *vice versa*, and irrigating through these openings. By tamponnading the cardiac and cervical ends of the tube, we may hope to keep wound aseptic.

9. From a wound in the neck, internal œsophagotomy can be carried out in the same way, and with the same instruments, as used for dividing strictures of the anterior urethra from within. The division should be made in a retrograde way only, the knife being passed first beyond the stricture. A guide pushed up from the gastric fistula will help to accomplish this, even in obstinate cases. It may become necessary, especially in adults, to have an instrument of a special length, and sometimes also with a special curve, made for the purpose.

Treatment of Empyema—At the meeting of the British Medical Association, held at Nottingham in July, 1892, a discussion of the Surgery of Thorax took place and Mr. Rickman Godlee opened the discussion, in the course of which in speaking of empyema he said (*Brit. Med. Jour.*, October 15, 1892), The site of election for incision in empyema is just above the level to which the diaphragm becomes adherent to the ribs when it has been drawn up as much as possible. This point is opposite the ninth rib just outside the angle of the scapula. It is the most dependent point when the patient is standing up or lying on his back. As a routine practice he removes a piece of rib, because (1) it allows of the best possible exploration of the

pieura, (2) it permits the evacuation of masses of lymph, (3) it obviates to a great extent the difficulty of retaining or re-introducing the tube. The removal of a piece of rib greatly facilitates the better treatment and does not add to the danger of the operation. When there is danger of giving an anæsthetic on account of over distension, then Mr. Godlee first draws off some of the fluid into an aspirator before giving the anæsthetic. He uses a large rubber drain as large as the little finger for an adult, smaller for a child. It should be just long enough to enter the chest cavity, and have not more than one, or at most two holes close to the end. It should never be shortened, but when the proper time comes it should be removed altogether. The time of removal depends on the quantity and character of the discharge, so no definite time can be stated. The time is usually ten days in a young child, three weeks in an adult.

In very bad cases the patient in operating should not be put far over on his sound side, but he should be brought over the edge of the table, and the operator should, if necessary, sit down. If the chest be very full, a good plan is to place the patient well over on the diseased side. It will then be found quite easy to reach the ninth rib outside the scapular line by standing behind him. As an anæsthetic in these cases he believes chloroform to be the best. Complete anæsthesia should not be induced.

Double empyema is not so rare as one might think. A single empyema is occasionally missed, so also a second small empyema may sometimes escape notice when one side has been dealt with. Some are septic and then they are localized. Some are probably tuberculous. A septic case may be very acute, so that it is necessary to operate on both sides at the same time, or within short periods. Usually it is best not to open both sides at the same time, but wait until the patient is accustomed to the disturbance of respiration caused by the operation. Much caution should be used in dealing with a tuberculous empyema and pyopneumo thorax, especially in adults. If the disease is quiet leave it alone, as a free incision will almost certainly accelerate the patient's death. Mr. Godlee recommends the following plan: Into the anterior part of the chest a needle is to be in-

serted, connected with an india-rubber tube passing into a bottle containing some sterilized or antiseptic water; another needle, connected with the aspirator, is then inserted into the most dependent part of the chest and pus drawn off. After a while the fluid flows in to replace the pus, and at last it will flow clear into the aspirator bottle. Then the anterior needle may be taken out and the greater part of the liquid may be withdrawn from the pleura. A simple pneumo-thorax may be much relieved by drawing out the air with an aspirator. All cases of empyema do not recover, and Mr. Godlee mentions a number of causes of death, chiefly septic or abscess of brain, septic nephritis, shock, hemorrhage, embolism, etc. He says great care should be exercised in washing out the cavity. It is only necessary in fetid cases, and then only if the discharge remains or becomes offensive several days after operation.

I can heartily endorse all that Mr. Godlee says about the operative proceedings in empyema. For years past I have always insisted on the advisability of removing a portion of rib with bone forceps, after having stripped off periosteum, for purposes of thorough drainage, and because the after dressings are so much more easy and less painful. Washing out, except in fetid cases, is a useless proceeding and cases do better without it. The use of the large rubber is also much more comfortable than any metal or glass drain.

SYMPHISIOTOMY IN A MAN.

At the meeting of the Académie de Médecine. of Paris, January 17th, M. Albarran presented a patient on whom he had performed the operation of symphiotomy in order to remove an epithelioma of the bladder. (*La Trib. Méd.*, January 19th, 1893.)

Reviews and Notices of Books.

A Treatise on Nervous and Mental Diseases.—For Students and Practitioners of Medicine. By LANDON CARTER GRAY, M.D., Professor of Nervous and Mental Diseases in the New York Polyclinic, etc. With one hundred and sixty-eight illustrations. Philadelphia: Lea Brothers & Co. 1893.

Still another to the already long list of systematic treatises on diseases of the nervous system. Dr. Gray's name has been well known for many years in connection with neurology. He has written a work which in our opinion is the ablest production up to the present in this department of medicine from an American author. His own experience, especially in the therapeutics of disease is freely given. There is no lack of the *Ego* in this treatise. The following sentence from the article on neurasthenia will explain our meaning:—"If I am asked why I should be so dogmatic about the matter (referring to the treatment of neurasthenia), my answer would be simply that my dogmatism has been forced upon me by a long series of mistakes in my early days, and since I have reached my present conclusion I welcome cases of neurasthenia, whereas I formerly dreaded them." Somewhat similar sentences may be found here and there throughout the book. In spite of them it is worthy of perusal. The chapters on Mental Diseases will, we think, be of special value to the general practitioner.

A Treatise on the Ligation of the Great Arteries in Continuity with Observations on the Nature, Progress and Treatment of Aneurism. By CHARLES A. BALLANCE, M.B.M.S., Lond., F.R.C.S., Assistant Surgeon to St. Thomas's Hospital, and Joint Lecturer on Practical Surgery in the Medical School; Surgeon to the National Hospital for the Paralysed and Epileptic, Queen Square; Assistant Surgeon to the Hospital for Sick Children, Great Ormond Street, and WALTER EDMUNDS, M.A., M.C., Cantab, F.R.C.S., Resident Medical Officer, St. Thomas's Home. Illustrated by 10 plates and 232 figures. London: Macmillan & Co., and New York. This volume contains the record of a large amount of ori-

ginal work extending over a period of six years. The subject is treated very fully and from all points of view. Commencing with hæmorrhage in man, the nature of arteries is next taken up and much valuable information given regarding the variations with position and age. Physiological and pathological occlusion is treated of, and that brings us to the obliteration of arteries by means of the ligature. This is viewed from the standpoint of the clot, the coats and the ligature respectively. There is a very valuable chapter on the choice of the ligature which is thus summed up by the authors: "The choice then must fall on ox peritonæum, kangaroo tendon, or boiled floss silk; and failing these on boiled Chinese twist, chromic catgut, or silk-work gut." The knot is also discussed and objections shown to most ordinary methods. It is recommended to employ two or more separate ligatures tied with what is called a "stay knot." It is shown that the slipping of the knot is one of the most frequent causes of hæmorrhage, and that the slipping may occur either after the knot is tied or during the process of tying. It is also advised not to rupture the coats of the arteries, merely to occlude them. The book is well printed and illustrated by numerous plates, and should be read by every surgeon.

A Treatise on Diseases of the Rectum, Anus and Sigmoid Flexure. By JOSEPH M. MATHEWS, M. D., Professor of Principles and Practice of Surgery and Clinical Lecturer on Diseases of the Rectum, Kentucky School of Medicine; Visiting Surgeon Sts. Mary and Elizabeth Hospital; Consulting Surgeon Louisville City Hospital, etc. With six chromo-lithographs and numerous illustrations. New York: D. Appleton & Co.

This is the record of the personal experience of the author in this important and rather neglected field of surgery. The conclusions drawn and the procedures recommended are the result of his own observations, and cases are freely quoted to substantiate the statements advanced. There is much that is new in the book, and the various methods of dealing with diseases of this part of the body are fully discussed, and the reasons are given why the writer prefers certain forms of treatment. The book is written in a most temperate manner,

not laying undue stress upon the importance of the subject, and not endeavouring to prove that all the ills the flesh is heir to may be cured by an operation on the anus or rectum. The author is able to speak with authority on the subject, having had a large experience extending over a number of years, hence his opinion is worthy of consideration, even if his views conflict at times with those generally accepted by the profession.

Human Embryology. By CHARLES SEDGWICK MINOT, Professor of Histology and Human Embryology, Harvard Medical School. Boston. New York: Wm. Wood & Co.

This work can scarcely receive justice in a short review, for each chapter deserves special mention and praise. The work is divided into five parts. The first is taken up with the Genital Products, giving a full description of the anatomy, comparative anatomy and functions of these products, and in a way which, though sometimes arbitrary, yet always gives new light. The origin of the ovum with its successive stages in development are clearly shown and though he passes over the views of Kölliker and Sebatier as deserving of slight mention, there can be no mistake made as to what the author himself thinks. His second part is a description of the Germ Layers. This cannot be said to contain anything very new; however, it states clearly the various views held upon Segmentation and enlarges upon the view put forward in 1887 by the author concerning this subject, viz., "That in all animals the ovum undergoes a total segmentation, during which the cells of the ectoderm divide faster and become smaller than the cells of the entoderm." Parts III. and IV. deal with the Embryo and Fœtal Appendages and contain all the latest views on these subjects, as well as many very valuable plates illustrating certain steps and proving certain assertions. Many of the old theories are here exploded and much new light added to what still remains somewhat obscure. Part V. deals with the Fœtus entirely, and begins by repeating what the author has already published in his article in *Buck's Handbook of Medical Science*, but has here added some very valuable plates from his own and other collections, which add much to the value of the article. The data given on the growth of the fœtus are very elaborate, and the author still impeaches Tolot

for passing off counterfeit matter and treats as of no account what many embryologists have considered to be *authority* on this subject. His—whose work on the growth of embryo appeared in 1892—is still regarded as the best authority on this subject, notwithstanding that many observations have been made since then. In the development of the skeleton we will only refer to the chapter on the skull, which is perhaps one of the best *resumes* on this particularly knotty point that can be found. The old theory of the cranium being composed of expanded vertebrae is still taught by those who live in the 18th century, but by the advanced embryologists, such as the author, is ignored. Huxley, in 1858, was the first who opposed this theory, but he stood almost alone until Gegenbauer, twenty years late, published his work on the "Cephalic Skeleton of the Selachians."

Diseases of the Eye. Ear. Throat and Nose. By FRANK E. MILLER, M.D., Throat Surgeon, Vanderbilt Clinic College of Physicians and Surgeons, New York, JAMES P. McEVROY, M.D., Throat Surgeon, Bellevue Hospital, Out-Patient Department, New York, and JOHN E. WEEKS, M.D., Lecturer on Ophthalmology and Otology, Bellevue Hospital Medical College, New York. Being Volume 10 of the Students' Quiz Series, edited by BERN B. GALLAUDET, M.D., Demonstrator of Anatomy, College of Physicians and Surgeons, New York; Visiting Surgeon, Bellevue Hospital, New York. Pocket-size 12mo., 218 pages, with 89 illus and 2 full-page plates.

This, the author says, is a digest of the best and latest works on these specialties, and truly it is so, only the hard and dry facts being left by the process. It is a very favourable specimen of this class of publication which aims at reducing the various branches of medicine and surgery to their smallest dimensions and rendering them more easy of assimilation, in fact at providing a royal road to learning. For the student cramming for an examination or any practitioner who is satisfied with a smattering of his subject they are just the thing, but they have no place in the library of any one who has a true love for his profession.

Society Proceedings.

THE MONTREAL MEDICO-CHIRURGICAL SOCIETY.

Stated Meeting, November 25th, 1892.

JAMES STEWART, M.D., PRESIDENT, IN THE CHAIR.

New Members.—Drs. H. D. Hamilton, N. D. Gunn and J. G. Adami were elected ordinary members.

Dislocation of the Eleventh and Twelfth Dorsal Vertebrae.—Dr. ARMSTRONG brought before the meeting a man upon whom he had operated for this injury. Last September, the patient while driving under a gateway was doubled up between the top of the gate and his load. On entering hospital on examination a distinct interval of one and a half inches could be felt between the spines, just as if one had dropped forward. There was no paralysis but marked pain and hyperæsthesia. patellar reflex and ankle clonus absent, and no loss of control over the sphincters of the bowel or bladder. On the third day (the patient having up to that time refused to allow anything to be done), he was etherized, and after an unsuccessful attempt was made to reduce the deformity, Dr. Armstrong cut down and found that the articular processes of the eleventh vertebra instead of being behind the twelfth had slipped up and become caught, but on bending the man forward he managed to get them back into place. The immediate result was the relief of the pain and hyperæsthesia, but the patellar reflexes are still absent. He had last summer met with a similar case in which on failing to reduce the deformity he had cut down, but found a fracture with injury to the cord. Shede has reported a number of cases and recommends cutting down and finding out the exact condition; if the cord is much injured nothing can be done, but if spicules of bone are removed a better result may be expected than if they were allowed to remain.

Dr. JAMES BELL emphasized the necessity of early operation in such cases. Experience has shown that not infrequently pressure may be removed and the integrity of the cord restored, while if left alone softening would follow. He does not even despair of cases in which there is extensive injury. He had operated upon dogs and found that the cord

can be stretched, but suturing is almost impossible on account of the soft structure. Prof. Maydl, of Vienna, has been making similar experiments, but his reports are not favourable. He (Dr. Bell) thought that it is just as bad surgery to leave such a case to nature as it would be to leave a case of intestinal obstruction.

Excision of the Wrist.—Dr. ARMSTRONG presented a man from whom he had removed the wrist joint for tubercular disease. The case was instructive as illustrating the amount of motion that can be obtained, flexion and extension are well performed, and the hand is not in the least œdematous. All the carpus, except the pisiform bone, the ends of the radius and metacarpal bones were removed, but unfortunately the disease has gone on in the pisiform bone and it will have to be removed.

• *Multiple Aneurism; Aneurism of Superior Mesenteric; Abdominal Aorta; Right Subclavian and dissecting Aneurism of Aorta; Cirrhotic Kidneys.*—Dr. FINLEY exhibited the specimens from a case of multiple aneurism. The subject was a female, aged 48 years, rather thin, much blanched and with slight œdema of the lower extremities. A considerable quantity of partially clotted blood was found in the peritoneal cavity. There was an aneurism of the superior mesenteric artery about an inch from its origin, lying behind the pancreas, third portion of the duodenum and the mesentery. On section the wall of the vessel was surrounded by recently clotted blood, bounded by the above named structures and communicating with the peritoneal cavity by a small opening on the right side of the mesentery. A true aneurism of the superior mesenteric artery was thus formed which had evidently recently ruptured, first into the surrounding structures and later into the peritoneal cavity. A small sacculated aneurism of the abdominal aorta arose just to the left of the celiac axis, and was lined with laminated decolorised fibrin. A dissecting aneurism forming a firm, solid mass in front of the thoracic aorta and alongside the œsophagus arose an inch above the celiac axis and passed up as far as the bifurcation of the trachea, where it terminated in a blunt conical end. This mass was traversed by an irregular channel containing blood; its wall was formed of a distinct layer formed by the outer coat of the aorta and

was lined with a reddish-colored thick adherent layer of fibrin. A fourth aneurism was found on the anterior wall of the subclavian artery an inch in diameter and lined with a thick layer of laminated decolorised clot.

The aorta presented a few gelatinous raised plaques, but no calcareous change. Both kidneys were small, the right weighing 110 grams and the left 100, and presented the microscopic and macroscopic appearances of fibroid change. The heart weighed 350 grams. The left-ventricle was thickened, the anterior papillary muscles transformed into a fibroid mass, and the coronary arteries showed a few irregular areas of atheroma. The other organs were normal. The brain was not examined.

DR. SHEPHERD, who had had the patient under observation, gave the following history: For two years she had been troubled with dyspeptic symptoms, with gradual weakness and emaciation. Six weeks before admission she began to suffer from abdominal pain of a continuous gnawing character and occasionally referred to the back. Three weeks later she suffered from persistent vomiting.

On admission, August 15th, somewhat emaciated, muscles small and flabby. Vomits frequently without any relation to taking of food, and with relief to pain. A pulsating tender mass about the size of a hen's egg is felt two inches above the umbilicus and half an inch to the right of the median line, and readily moved from side to side. Urine normal.

There was a clear history of syphilis, alcoholism and rheumatism.

An exploratory incision was made by Dr. Shepherd on August 17th. and on pushing the finger well down toward the vertebral column a pulsating sessile aneurismal tumor was found in front of the aorta and evidently connected with the superior mesenteric artery. The abdomen was closed and good union took place on September 5th, the pain which continued after the operation greatly increased and the tumor increased in size. Death took place rather suddenly on September 11th, the patient becoming blanched and pulseless.

Dr. Shepherd remarked that he had refrained from tying the artery above the aneurism owing to the probability of causing gangrene of the intestine, as this vessel supplies all

the small intestine and half the large. He also remarked on the rarity of aneurism of the superior mesenteric artery, the usual vessel affected being the coeliac axis. The other aneurisms had not been recognized before death.

The PRESIDENT remarked that it was most fortunate that Dr. Shepherd had refrained from tying the mesenteric artery. Last summer he had seen two cases of plugging of the mesenteric arteries followed by gangrene of sixty-nine inches of the bowel, death having occurred in thirty-six hours. The diagnosis had been peritonitis.

Double Nephro-lithotomy.—Dr. JAMES BELL exhibited calculi and gave the following history:—

A. B., aged 45, was admitted to hospital in January, 1892, for calculous pyelitis of the right kidney and stricture of the deep urethra. The stricture was first treated by internal urethrotomy, and the right kidney operated upon in March, 1892 (nephro-lithotomy), a large branched calculus being removed. The patient recovered satisfactorily without bad symptoms, but the urine never became quite clear, and after the wound had healed and the patient allowed up the amount of pus in the urine increased. Pain in the bladder was complained of, but exploration failed to discover any stone. The patient was discharged in May, but returned in October weak, pale, ill and feverish, with evident pyonephrosis of the left kidney. The kidney was opened, six medium-sized calculi, with much calcareous debris and many fragments of stone removed with nearly a pint of pus. The operation was not prolonged nor difficult and the patient was sent back to the ward in good condition. For fifty-four hours after the operation not a drop of urine was secreted; the symptoms were great restlessness, pallor, vomiting, headache and a small rapid pulse (150); the general symptoms resembled those in a patient suffering from exhausting hemorrhages. The loins were cupped frequently, normal saline solutions infused beneath the skin daily and hypodermic injections of Tr. Digitalis given from time to time. From the time of the first secretion of urine the general symptoms improved and within a week the patient's condition was excellent, and now, a month after the operation, he is passing daily 40 to 50 ounces of clear

urine, containing only a trace of albumen, and the wound is healing rapidly.

The noticeable features of the case are prolonged suppression of kidney function and the spontaneous product of stones in the kidneys. Double nephro-lithotomy for calculous pyonophrosis followed by recovery is also comparatively rare.

Dr. SHEPHERD said that this case showed that we should not too hastily remove a kidney, for if this man had had his kidney removed last winter he would not have lived, as the remaining kidney could not have performed its function for the whole body.

Dr. SMITH asked if ether had been the anæsthetic used, as he understood that suppression of urine often follows the use of ether, he had never heard of such an occurrence after the use of chloroform.

Dr. BELL said that he had never observed suppression after ether, but there are numbers of deaths after operation on the urethra where chloroform had been used.

Dr. G. G. CAMPBELL had never seen suppression after ether, in fact he had frequently seen an increased amount of urine.

Excision of the Wrist.—Dr. BELL exhibited the forearm and hand of a woman aged 44, whose wrist he had excised in January, 1887, for tubercular disease; he had removed all the bones of the wrist joint except the pisiform; the result was quite a stiff wrist, not nearly so good as in Dr. Armstrong's case. Dr. Springle had obtained the specimen from the dissecting room.

Ovarian Abscesses.—Dr. ARMSTRONG exhibited the specimens and said that the patient from whom they were removed had given a history of recurring attacks of peritonitis for ten years, and for the last year has been in bed; she came to the hospital with her pelvis full of fluctuating masses. The chief point of interest is the extreme degree of adhesions between the intestines. There was free oozing, after operation there had been no obstruction to flatus or faeces, and the patient made a good recovery.

Dr. SMITH had been at the operation and observed the great difficulty in detaching the adhesions. This condition is set up in many young women by gonorrhœa, and such cases should not be left long with the pus leaking from the tubes. He had

an opportunity of re-opening a patient in whom he had used the thermo-cautery for bleeding, and eight or ten feet of the intestines could be lifted out in a mass. Yet that patient is in good health and her bowels are regular.

HAMILTON MEDICAL AND SURGICAL SOCIETY.

CASES REPORTED BY ARCH'D E. MALLOCH, M.D.

Mr. Chairman and Gentlemen:—Some months since I brought before you several cases of surgical knee-joint affections, and thinking that a continuation of the series might be of interest, report to-night the cases, other than those of simple synovitis that have occurred in my practice since then, exhibiting the patients that you may judge for yourselves of the results. In addition I will report a case of compound fracture of the thigh and show you the patient.

CASE I.—*Gelatinous degeneration of the knee-joint; tumor albus; tubercular arthritis: incised and scraped; recovery; movable, useful joint.*

J. M., aged 13. Seen with Dr. McCabe on the 8th April, 1891, suffering from disease of the right knee.

Confined to bed, suffering from pain in the joint, chiefly at night, and with "startings" of the limb; is feverish and has little or no appetite. The joint is much swollen, slightly flexed and rigid; the condyles of the femur are expanded, but the swelling is chiefly due to thickening of the synovial membrane; in two places, one above and one below the patella, the swelling is prominent and soft, and gives the impression of fluctuation; the limb is much atrophied. The lameness and swelling have been coming on for some months. Father and mother living; a brother died of phthisis three years ago. Limb to be thoroughly scrubbed and washed and wrapped during the night in a towel wrung out of a 1 to 1000 corrosive sublimate solution.

9th.—Under chloroform a free incision was made into the bulging swelling above the patella; on pressure being applied a yellow-greyish jelly-like mass three inches in diameter and three-quarters of an inch in thickness was forced out of the wound; additional incisions were made on each side of the patellar ligament, and through them the bluish-grey thick-

ened synovial membrane was thoroughly scraped with a sharp Volkman's spoon and with the finger-nail, and the *debris* removed by flushings of 1 to 1000 sublimate solution. Finally the joint was filled with a 10 per cent. mixture of iodoform and glycerine, and then thoroughly moved to bring the mixture into immediate contact with all its recesses; drainage tubes were inserted, the wounds covered with Lister's protective and the joint enveloped in a large and thick moist sublimate gauze dressing. Limb supported on a posterior straight splint.

10th, 10.30 a.m.—Temperature 99°; dressed; skin blistered from the dressings; joint syringed with a 1 to 1000 sublimate solution; tubes replaced; skin powdered over with boracic acid powder, and a well squeezed out moist sublimate gauze dressing applied. 9 p.m., temperature 101°.

12th, 11 a.m.—Temperature 98 2-5°. Very little discharge on dressings. A permanent posterior splint was applied with paraffine bandages.

The case was subsequently attended to by Dr. McCabe.

July 27th.—Had been using the limb for some time; the leg can be almost completely extended and can be flexed to a right angle; the limb is almost as large as the sound one; he engages in the games of the other boys and says that his general health is perfectly good.

CASE II.—*Very severe injury to knee from circular saw. Recovery, with perfect movement.*

July 20th, 1891.—J. V., aged 14, a patient of Dr. McGregor of Waterdown. Seen between two and three hours after the accident. Joint completely exposed by an oblique wound, from the inner side upwards and outwards, with serrated edges extending from side to side in front, made by kneeling on a revolving circular saw. Patella sawn through transversely a little below its middle; the anterior half of the inner condyle cut through vertically and only attached above to the soft parts by a narrow strip of periosteum; there is also a short superficial cut with serrated edges at the level of the tibial tuberosity; no hæmorrhage. Dr. McGregor had removed one or two small pieces of bone which he had found lying loose in the joint. After thorough cleansing the almost separated portion of the condyle was removed, the patella

drilled and sutured with thick prepared Chinese twist, and its sheath stitched with catgut and the skin wounds with silk sutures, after the insertion of a drainage tube on each side at the most dependent points of the exposed surface; wounds dressed with protective and moist gauze and the limb supported on extemporized Watson's excision splint, made from Gooch's splinting, which was kept in place by paraffin bandages; limb placed in a Salter's cradle.

21st, noon.—Rested pretty well; had complained of some pain in abdomen and on outer side of joint; pulse 86, temperature 100 1-5°; dressings saturated with bloody serum; wounds quite quiet; redressed; case left under Dr. McGregor's care.

Aug. 4th.—Dr. McGregor reports by letter: "My patient is doing well; there is practically no discharge, except a little blood at the corners of the wounds which were left open; there has been no pus or smell and lately no puffing or swelling; there never was any discharge from the first from the drainage tubes. I have been shortening them little by little and one is now away; the stitches are all out; wounds have united by first intention. Pulse kept about 76; temperature 98° to 99°; sleeps well and eats well, but always complains of having had a little pain during the day."

Aug. 16th.—Seen to-day. Wounds healed, with dry patellar suture hanging out of the middle of the scar; limb still in splint. Early this spring (1892) he walked into Dr. McGregor's office with a friend, and at first I did not know which was the old patient. He said that he kept pulling at the ligature every day till it came away two months or so after the accident.

CASE III.—*Ruptured ligamentous union of patella; Lister's operation; recovery; good result.*

A. D., aged 45, admitted into the City Hospital 31st December, 1891. In September last she fractured her right patella; result, ligamentous union; about the first of November she began to go about and to do her work. A week since she fell again and hurt the same knee, rupturing the ligamentous band of union.

Jan. 13th.—All effusion having disappeared, Lister's operation by vertical incision was performed; it was found that the ligamentous band had separated from the lower fragment; after

paring the bones the pieces were separated by fully an inch; ends of wire brought out of centre of wound; a drainage tube was introduced into the most dependent portion of joint on its outer side; limb dressed with protective and moist sublimate gauze and then placed on a Watson's excision splint and bound to it with paraffin bandages.

Jan. 21st.—Temperature has been normal since the 14th. Dressings removed for the first time and found quite dry where soiled over the wound and the drainage tube; stitches and drainage tube removed; wound healed.

22nd.—Leg below knee œdematous without flush; temperature natural; splint and dressing removed, but nothing was found to account for the œdema excepting an erythematous blush where the skin had been covered with the moist gauze, Boracic acid powder and boracic acid gauze substituted; splints re-applied; *25th*, temperature natural.

Feb. 22nd.—Under chloroform free movements of joint made. *March 10th*, went home to her work with fairly good movement.

April 5th.—Wire removed; has been working as usual since leaving the hospital.

Dec. 3rd, 1892.—Flexes knee to more than a right angle.

CASE IV.—*Periostitis of patella; abscess with loose necrosed patella; useful joint.*

July 14th, 1892.—D. G., aged 11, a patient in St. Joseph's Hospital, under Dr. McGillivray's care. Right knee swollen and red, chiefly on anterior and outer aspect, fluctuating and with a small ulcerated spot from which a thin serous discharge was escaping. History of Traumatism some months since. The appearance suggested a superficial suppuration rather than synovial. Knee to be thoroughly washed as usual.

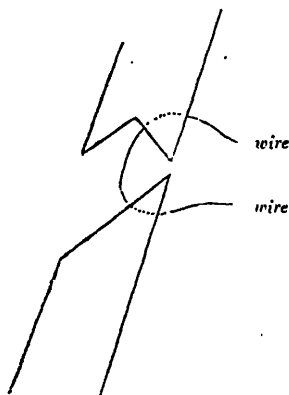
July 15th.—Abscess opened and the loose necrosed patella which I have here was turned out; sac thoroughly scraped and washed out with 1 to 1000 sublimate solution; dressed in the ordinary way and supported on a posterior splint.

July 23rd.—Dressed for first time; wound superficial, cicatrising; dressed, not seen again.

Necrosed bone is a shell the shape of the patella, one inch long by three-quarters of an inch in breadth and three-eighths of an inch in thickness.

CASE V.—*Compound fracture of the thigh; wired; recovery; useful limb.*

June 12th, 1892.—J. McN., aged 12, hospital patient. Compound fracture of left femur, with small wound on outer side of thigh, about its middle, from which blood is escaping; three hours have elapsed since he fell from the tower of St. Lawrence church. Fracture had been set by Dr. White and a temporary splint applied. Patient suffering considerably from shock; a six inch incision was made on outer aspect of thigh, having the original wound about its middle, two loose pieces of bones were removed; the ends of the bones presented this appearance:



The end of the upper fragment was notched, that of the lower sloped to a point from below upwards and outwards. Wishing to expedite the proceedings as much as possible, and believing that the periosteum would make up for the lost bone, I drilled the upper fragment from the outer side to the summit of the notch, and the lower fragment about the same distance from its point; the wire passed through the openings, when shouldered and locked, held the bones firmly together; wire brought out of original wound. After stopping all the bleeding and washing the wound thoroughly with 1 to 1000 sublimate solution the wound was stitched with deep and superficial silk sutures, excepting the original wound. Wound dressed with powdered iodoform, protective and moist sublimate gauze, snugly held in position by a moist sublimate

gauze bandage; the thigh and upper portion of the leg was then thickly padded with sterilised cotton wool; finally plaster of paris bandages were applied from the toes to the waist. When placed in bed a long splint was applied to the sound limb.

A simple fracture of the right radius was put in anterior and posterior splints, but good apposition was not obtained. Between this date and the 1st of July, when it was taken down for the first time, the highest temperature recorded in the chart was on the evening of the 19th, when it was 101° ; on the 21st of June it fell to normal and remained subsequently at that. During all these days the lad never complained of his thigh.

July 1st.—Plaster cast at upper portion of thigh soft and giving off a urinous odour; dressings removed; thigh wrinkled; wound perfectly quiet; the discharge had soiled to outermost layer of cotton wool. Re-dressed and splints applied as before.

July 21th.—Since last dressing temperature and pulse have been normal. Wound exposed and silk stitches removed; considerable callus but union not firm; dressings and splints re-applied.

Aug. 20th.—Splints taken off and wire removed; bone solid; splints re-applied.

A week or ten days subsequently he was allowed to go about the ward on crutches, wearing a patten on his right boot.

Sept. 7th.—He slipped when going down stairs and hurt his thigh.

Sept. 9th.—The plaster was removed and it was found that he had re-fractured the bone. Put to bed and splints re-applied.

Nov. 1st.—Splints removed; bone solid; considerable callus; allowed up; passive motion to knee, which is stiff.

Nov. 14th.—Able to run about the ward; very slight motion at knee-joint.

Nov. 28th.—Learning that chloroform was to be administered and the knee-joint loosened he ran out of the Hospital.

NEW INSTRUMENTS.

SAMWAYS' TOURNIQUET CLIP.

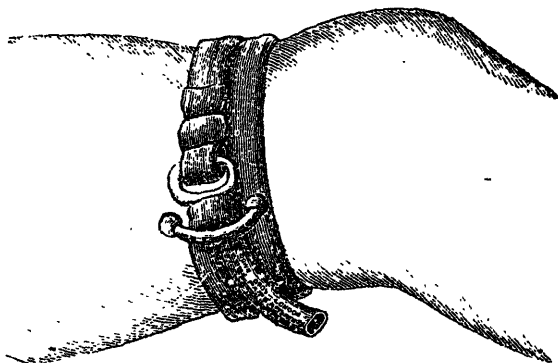
Two new forms of fasteners for use with india rubber Tourniquets have lately been patented by Messrs. Down Bros., instrument makers of St. Thomas's St., London, S. E.

They are known as Samways' Clips, after Dr. Samways, of Guy's Hospital, the inventor.

The simpler is shaped like an anchor and is of about an inch in total length. It differs from an anchor in that the ring is oblong, with its long axis transverse to the shank to which it is rigidly fastened.

There is no stock and the free ends of the flukes are knobbed instead of spade-like.

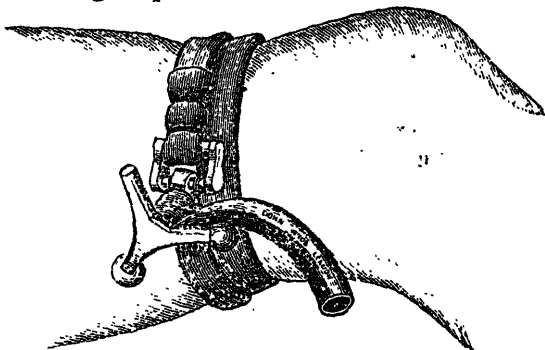
To apply the tourniquet the clip is held in one hand and the stretched rubber is carried once, twice or thrice round the limb, then passed beneath one of the anchor flukes over the shank and back beneath the other fluke and let go. The accompanying diagram illustrates the "Anchor Clip" tourniquet when applied.



The second form of Dr. Samways' clip is made to resemble a grapnel, and has three flukes instead of two.

The flukes are set at an angle of 120° to one another, and are slightly inclined towards the shank. The ends of two of the flukes are knobbed. The grapnel ring is oblong as in the anchor clip model, and the rubber is similarly attached permanently to it. The ring, however, is not rigidly fixed to the shank.

To apply the Grapnel tourniquet the clip is held in one hand with the two knobbed flukes pointing down towards the limb. The stretched rubber tubing is then carried once, twice or thrice round the limb, passed beneath one of the knobbed flukes over the shank and out beneath the other knobbed fluke and let go. The fastening may be rendered still more secure if the rubber, instead of being led out beneath the second fluke, is passed, as in the diagram, further round the shank and brought up between the first fluke and the rubber.



The advantages claimed for these clips are:

1. They are small and light.
2. They are simple and cannot get out of order.
3. They are very quickly applied or removed.
4. The tighter the rubber is applied round the limb the more securely the clip holds it.
5. The clip does not cut the rubber.
6. The clip fastens equally well at any point along the length of the rubber.

Selections.

Two Practical Suggestions for Analysts of Urine.—I have devised the following formula which can be used in the intervals between the estimations in well marked cases of diabetes: Divide 880 by the number of ounces of urine passed in twenty-four hours. To the result add 1,000, and subtract the sum from the specific gravity of the urine. The result will be the number of grains of sugar to the ounce of urine. The primary number, 880, may be for greater accuracy, altered to suit exactly individual cases as determined by experiment. For example, suppose a patient to pass 100 ounces of a specific gravity of 1.030.

$$\frac{880}{100} + 1,000 = 1,008.8. \quad 1.030 - 1,008.8 = 21.2.$$

The patient has about 21 grains to the ounce. Now, if in this individual case, the result was found to be too far from the truth, a suitable number would be substituted for 880, which, though the best co-efficient for general use, yet is not so good for particular cases as one that may be determined by experiment.—*Louis F. Bishop, M. D., in N. Y. Med. Journ., Oct. 8, 1892.*

Personal Recollections of Delirium.—In a paper on "Sleep, Dreams and Delirium" (*Glasgow Medical Journal, October 8th*), Dr. Joseph Coats points out certain differences between dreams and delirium. In dreaming the activity of the nervous centres, occurring during sleep, produces little or no impression upon the consciousness, but delirium occurring when a person is awake often produces a marked retention of activity in the centres of consciousness. The consciousness may be so dulled that the phenomenon may approach dreaming, but this he believes to be exceptional. In delirium, what passes through the mind may be retained there and believed to have actually occurred; in dreaming, this practically does not happen. The author quotes his own experience when attacked with delirium, and gives at length a letter recently from Dr. W. T. Gairdner, describing an account of his experience in the delirium of typhus fever.

While still a medical student Dr. Gairdner had a severe attack of typhus fever, being for some time delirious, then comatose. At the time, he was about to write a graduation

thesis on the subject of "Death," and this subject was very prominent during the delirium. Although fully aware that he was soon likely to die, it did not alarm him at all. He remembers a feeling of unrest, dissatisfaction and apparent anxiety about something that had got to be done and could not. A little later he became convinced that he was dead, but this fact did not in the least distress or horrify him; he had, on the contrary, a curiosity to witness his own autopsy, and he retains a most vivid impression of standing by his own *post mortem* examination in the theatre of the hospital with much interest in the question whether ulceration of Peyer's patches would be found in the intestines or not. He also retained during his convalescence a vivid impression of having seen his remains recently buried. After the coma which followed this delirium had passed, a delirium of a more quiet form came on in which the sense of distressing unrest had entirely disappeared. The last impression left upon his mind before recovering normal consciousness was a vision of the resurrection. As convalescence progressed it seemed to him that he had acquired a new faculty, that of dreaming at will. He could for some time together give way to these visions in perfect comfort and with ecstatic feelings of enjoyment. The strictly intellectual power was being recovered in the very midst of these voluntary visions, so that he could either shut his eyes and dream or open them and think as he pleased. The thesis which he had begun to think over, but had not written before his sickness, arranged itself in his mind during his convalescence and was subsequently written out upon the plan which he had devised and completed in moments alternating with his visions of Elysium. He concludes by saying that this thesis could not have been very bad after all since it won him a gold medal.

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SCIENTIFIC INVESTIGATION OF INFECTIOUS
DISEASES.

The shortcomings of the Montreal Health Department have been strikingly brought out by a recent outbreak of typhoid fever among the customers of a certain milkman resident near the city, and who supplied about sixty families in Montreal. Within the space of three months nearly thirty cases, three of which proved fatal, developed among his customers.

In November, 1892, two severe cases of typhoid fever, one of them fatal, occurred in a family on Bishop street. As the two persons affected were the only members of the family who drank milk, the suspicion of the attending physician was naturally directed to the milk supply as the probable means of infection. The City Health Department were promptly notified on November 14th, both of the occurrence of the cases and the suspicion about the milk, and were called upon to investigate and take steps to prevent the disease from spreading. In spite of this plain warning the Health Department made no investigation, and remained in unruffled tranquility while case after case appeared among the families supplied with this milk. It must be admitted, however, that the Montreal Health Office was not aware for some time of the extent of the outbreak, owing to the fact that many of the cases were not officially reported by the medical men attending them. On February 15th, 1892, although over twenty cases existed, only six had been reported at the Health Office! As the health officers rely for their information about the occurrence of infectious diseases on the physicians in attendance, it is the plain duty of every medical man attending a

case of infectious disease to report it to the authorities as soon as the diagnosis can be made, and a penalty is fixed by law for each case where this duty is neglected. Whether the practitioners who neglected to report their cases suppose that typhoid is not an infectious disease, or whether they neglected reporting them from a feeling that the information would be received at the Health Office as a matter of purely historical interest, to be used in compiling statistics, and that no practical outcome would result, we do not know; but it certainly is impossible for any health office, however much in earnest, to successfully combat infectious disease, unless the medical attendants report the cases promptly.

We notice a tendency among many of the best practitioners in Montreal to comment upon the alleged incompetence of the Health Department; but those in charge of the Department have difficulties to fight against which are not appreciated by the outside medical profession. The Montreal Health Office, to-day, is apparently run more for the benefit of the city scavenger than for that of the city. An enormous sum of money, sufficient to defray the scavenging expenses of a city three times the size of Montreal, is annually paid out; and yet the scavenging thus contracted for at three times its fair value is not done. Civic corruption, boodling, and ward politics hamper the executive officer at every turn. It would be better, in the public interests, if our physicians, instead of standing aloof and deriding the Health Department, would endeavour to aid the officials in every way, and co-operate with them heartily in anything tending to get rid of infectious diseases.

When the City Health Office was organized some years ago, one medical officer was deemed sufficient. Under him are placed a number of subordinates, but these, except in the case of the public vaccinators, have no medical training. When investigations have to be carried on, or inquiries made, the Medical Health Officer, not having at his disposal a physician, is obliged to entrust them to sanitary policemen, who know about as much of sanitary matters as other policemen or members of the laity. The public do not seem to understand that in a city the size of Montreal, at least three or four assistant medical health officers are absolutely necessary to see that

the instructions of the Health Officer are carried out and to make investigations, for which good laboratory equipment is indispensable. The people of Montreal have been expecting one man to do all this, and grumbling because he does not perform the impossibilities.

Even with all the support which it is in the power of the medical profession to render the Montreal Health Office, that any material improvement is likely to ensue in the near future, is more than doubtful; but, fortunately for us, the sanitation of Montreal does not end with the City Health Offices. The jurisdiction of the Provincial Board of Health comprises, when necessary, the city as well as the outlying country. When scientific investigations are necessary, they would be better entrusted to the Provincial Board of Health than to the city authorities. In the United States, the various State Boards of Health exert a great influence over urban sanitation, even in the case of large cities having fully organized health departments.

In the present outbreak of typhoid, the benefit of looking to the provincial rather than the city authorities, in the matter of investigation, seems very clear. It has been shown that typhoid occurred in 1891, in St. Laurent, where the suspected milk came from; though the medical men there state that they did not meet with any cases last autumn. The milk from this locality, however, gives rise to cases in Montreal nearly a year after the local outbreak at St. Laurent has ceased. Could the typhoid at St. Laurent in 1891 have been officially recognised by the provincial authorities, and its possible effects on the milk supply of the city borne in mind, radical improvement in sanitation might have been carried out in the interval, and the city protected. To properly investigate outbreaks of typhoid fever and cholera, chemical and bacteriological examination of the water supply, etc., is indispensable, for it is only by this means that the causes can be traced to their source. The city is innocent of any proper equipment for sanitary investigations, and milk analysis by the city means nothing more than determination of the percentage composition of the supply, so that adulteration can be detected. Adulteration of milk, though objectionable from a business standpoint, does not produce infectious disease, and

on the other hand the milk supplied in the case to which we refer, though evidently dangerous to health, has been shown by chemical analysis to be above reproach as far as richness in quality is concerned.

This absence of facilities for investigating the sanitary conditions of the suburbs obviously exposes the city to a great danger when infectious disease exists in the outlying country through contamination of the food supply.

The fact that the highest European and American sanitary authorities unite in prophesying that a widespread cholera epidemic during the present year is all but inevitable, makes the lack of appliances for sanitary investigation at the present time a matter for deep regret. It is known that some cases of cholera are sure to pass even the best of seaport quarantines in times of epidemic, and the best safeguard for a country (apart from that personal care and cleanliness only to be expected of the intelligent few) lies in providing for the prompt detection, isolation and disinfection of cases. Timely disinfection and isolation, however, can only be carried out where the means for prompt and certain diagnosis are available. By modern bacteriological methods the diagnosis of cholera can be made with certainty in the course of a few hours, and the information so gained, if properly made use of, enable the sanitary authorities to detect and deal with outbreaks of cholera at their commencement, when they can be restricted.

As there is very little prospect that the city will make any attempt to modernize its methods, it is fortunate that we possess in the Provincial Board of Health a body which, by the promptness and energy with which it has dealt in the past with actual and threatened epidemic, has secured the confidence both of the Government and the people of this Province. In the case of the present outbreak, immediately upon being notified the Board commenced a thorough investigation of all the circumstances connected with it and ordered the necessary analysis to be made, but unfortunately the Board was not notified that anything was amiss until three months after the disease had begun to attract attention in Montreal. What is necessary to increase the efficiency of our Provincial Health Office (which has done wonders considering the slender resources at its disposal) is (1) more prompt notification

of the occurrence of infectious diseases, and (2) improved facilities for investigating them.

An act passed at the recent session of the Legislature for the securing of vital statistics will in the future keep the Board well informed on the occurrence of infectious diseases, and we are glad to learn also that recommendations of the Board as to the necessity of improved means of investigation are receiving favorable consideration at the hands of the Government and are likely to be carried out in the near future. We feel confident that with proper facilities for investigation, the sanitary work of the Provincial Board will soon be on a par with that of any other similar organization. At the same time we cannot refrain from calling attention to the necessity of immediate preparation for the great danger which threatens us upon the opening of navigation and it is necessary to make some provision, however imperfect, for commencing work without delay. That the authorization and means for this work will be denied at such a critical time is, we trust, out of the question.

REPORT ON THE SANITARY STATE OF THE CITY OF MONTREAL FOR THE YEAR 1891.

This report has just come to hand and in it we find a great deal that is interesting and not a little that is curious. On the whole it is a most satisfactory report and shows the health of the city to be good. The death rate is lower than in previous years, being 24.24 per thousand, while the birth rate is increasing, there being over 26 births daily, or 43.87 per thousand, nearly double the deaths. Our death rate still exceeds that of London by 2.8 and is less than that of New York by 1.8 per thousand. Of the 5,391 deaths 515 were from phthisis, 332 from pneumonia, and 270 from bronchitis, a total of 1,117 from diseases of the lungs, while diarrhoeal diseases are accountable for 862. The mortality under five years of age was 57.78 per cent. of the whole, and 1296 of the deaths were of infants under six months, truly a terrible commentary on our system of foundling institutions. Some of the people, however, having survived the dangers of infancy, lived to a good old age, 267 being between 70 and 80, 167 between 80 and 90,

and 35 over 90 years of age. The season of year at which most deaths occur is, of course, the summer months, June and July, with the death rate somewhat less for August. Next to these months come December and March. The number of deaths is nearly the same for the two sexes, with a slight preponderance of males.

A register for the civil registration of unbaptised children was inaugurated and 162 births were thus registered. Why should not registration of birth be compulsory? Then a check would be kept whether vaccination was performed or not, and the number of unvaccinated children would not reach its present total for the year of 14,354. However, vaccination has been energetically carried out by the public vaccinators and has somewhat reduced this total. The question of a better system of disposal of the garbage of the city began to agitate the minds of the city fathers in August and a committee was then appointed to enquire into the matter and gather information. At the time of writing no practical result has come of all this gathering of information, so probably the process is still going on. The garbage of the city continues to be collected in the same perfunctory manner, and no proper system of incineration is carried out, most of the refuse being dumped on vacant ground. We are glad to note that the barbarous practice of cutting off the water supply for non-payment of taxes has been discontinued. This is a distinct advance in sanitation, for the old method was most inhuman and should never have been sanctioned. Imagine the state of a house with a water-closet and several sinks, but no water; the traps are soon emptied by evaporation and become merely ventilators for the sewers. What good is the endeavour to prevent the spread of diphtheria, typhoid and kindred diseases by isolation and disinfection when sewer gas is allowed, nay, encouraged to pour into the dwellings of people already, perhaps, reduced by poverty and want until their powers of resistance are no longer able to cope with the diseases arrayed against them.

The table of contagious diseases according to ages is very interesting. It shows that among the 230 cases of diphtheria reported none were under six months nor over 50 years of age, two were under one year, 88 were between one and five, and

84 between five and ten; of scarlatina there were 217 cases and 83 of these were between one and five and 82 between five and ten, only 14 were over 20; of 260 cases of typhoid, 80 were between 10 and 20 and 88 between 20 and 30; while 154 cases of measles were between one and five and 183 between five and ten, out of a total of 466. Although much has been done to improve the health of the city much still remains to be done, and we would exhort the officials, in spite of obstacles, to be not weary in well-doing.

The report is carefully compiled and is well put together, but it loses much of its value by being issued a year after the record closed.

THE GOVERNMENT OF VENEZUELA AND THE PAN-AMERICAN MEDICAL CONGRESS.

Senor P. Ezequiel Rojas, the Venezuelan Minister of foreign Affairs, has forwarded on behalf of his government, through the U. S. *Charge d'Affaires* at Caracas, a formal acceptance of the invitation issued pursuant to the joint resolution of the United States Congress to the various governments of the Western Hemisphere to send official delegates to the Pan-American Medical Congress. The selection of delegates has not yet been made, but the names will be forwarded at the earliest possible moment.

Obituary.

It is with deep regret that we record the death of Dr. Addison Worthington, of Clinton, Ont., at the age of seventy-four years. The Doctor, up to his recent and last illness, was actively engaged in the practice of his profession. Few men have had a greater love for their work than Dr. Worthington had for his profession. Partly educated in McGill University, in the days when Bruneau was Professor of Anatomy, Dr. Worthington always took the liveliest interest in all matters relating to the University. In matters concerning the progress of medicine, Dr. Worthington was an active supporter. The great success of the Huron Medical Association was mainly through his unwearied efforts. That the profession appreciated his worth is shown by his appointment to many leading positions, prominent among which was the Presidency of the Ontario Medical Association. Dr. Worthington is about the last of the medical pioneers of the Huron Tract.