however numerous in proportion to patients, there will always occur cases where some such method of feeding is plainly indicated.

I pass on now to consider the various methods of forced feeding at our disposal, briefly mentioning their several advantages and disadvantages, and indicating the class of cases in which each method finds its special application. Finally, I shall venture to enumerate some of the conditions in which forced feeding might possibly become a more or less valuable resource.

Methods of Forced Feeding.—Under this head I have nothing original to advocate. The methods are fairly well known, I believe, even though not as frequently and intelligently used as they might be.

1. *Œsophageal Tube by Mouth.*—This is the method I least advocate. It is not as generally useful as, and is, as a rule, more difficult to apply than, any other method. In any plan of forced feeding one cannot expect much co-operation from a young child. The most patient and experienced know how difficult it often is to get a glimpse of a child's throat even. Now, their power to resist in this method is greater than any other; and what with violent struggles, spitting, and attempts to bite the operation is not easy, and it leaves the patient distressed and exhausted. Moreover, it is in diseased conditions of the mouth and throat that forced feeding is often most usefully employed, and no less important is it to avoid the irritation caused by frequent manipulation. There are, of course, cases where it is easy and safe to feed this way. In such cases indiarubber or French catheters are probably the best Œsophageal tubes to use.

2. *Nasal Feeding*—(a) By pouring food down the nostril. (b) By nasal tube carried to the back of the pharynx. (c) By a tube passed through the nose into the Œsophagus or stomach. The first and second methods require that the several links in the chain of reflex mechanism for deglutition shall be intact. If this be so, then when fluids are allowed to flow along the floor of the nose to the pharynx involuntary acts of deglutition occur. In applying the first method, the child should be in the recumbent posture and the head held firmly, if necessary. For administering the food I generally use a glass syringe or indiarubber enema bottle. About an inch or more of drain-tube should be slipped over the nozzle of the syringe, and the tube should be placed only just inside the nostril. The food should be slowly injected, allowing regular intervals for breathing. Sometimes the child succeeds in spluttering some of the food from the mouth or ejecting it from the nostril. This may be owing to the too rapid administration of the food. Should this not be the cause then by closing the other nostril or the mouth for a moment the child will probably swallow, being "out of breath." A funnel with a piece of indiarubber tube attached would also answer the purpose. I always strive to use the simplest materials and those most commonly to hand. Warm fluids are less irritating than cold. If medicines of an irritating nature are also given they should be well diluted. I have not found that bland fluids such as milk or milk and egg cause anything but the slightest irritation either in myself or in children. "Watering at the eyes" sometimes occurs. If for any reason we do not wish the fluid to be injected to come in contact with the Schneiderian membrane, then we could use the second method; here a soft tube is passed through the nostril as far as the back of the pharynx before injecting.

The first method of forced feeding as far as my experience goes is the best in the largest number of cases. It causes a minimum of irritation, and an obstinate child finding it cannot resist these reflex acts of deglutition, often ceases all attempts to do so. It is the simplest method also, and has the fewest attendant risks. And the fact that it does not excite any great resistance in the child is a great recommendation. I had lately to perform tracheotomy on a strongly-built child of three years, comatose as much from diphtheritic as from carbonic acid poisoning. After the operation no pulse returned to the wrist and his colour did not improve. On attempting to give him hot brandy and milk he clenched his teeth and would have struggled violently. On giving it through the nose he swallowed without resistance.

The third method is one I have had occasion to use rather frequently. It is chiefly indicated in cases where food passes into the glottis, or where the necessary conditions for deglutition are imperfect or abolished. It is not so easy to apply as the first method, and causes more irritation. The mucous membrane of the nose, though very tolerant of fluids,

is not so accommodating towards anything solid. But in many cases in which I have used it sensibility has been blunted or abolished. On the other hand, even when this has not been the case, I have fed in this manner for days and weeks together with very little evidence of discomfort from the child, and with no apparent local damage. A case is on record¹ in which an adult for stricture of Œsophagus wore a tube passed through the nostril for ten months. After many trials upon myself and others I find a vulcanised indiarubber catheter the easiest to pass, and the one which causes least irritation. The catheters I have always used bear the name of "Jacques" as patentee; they are extremely well made and stiff enough not to kink. In young children a No. 7 is probably the most useful size. I generally inject the food by means of a glass syringe or indiarubber enema bottle. But as the end of the catheter is not easily slipped over the nozzle of the syringe, I unscrew the nozzle of an ordinary brass dressing syringe, slip the end of the catheter over its tapering end, and over its screw end place a piece of drain tube of sufficient size to admit the nozzle of the syringe. The catheter should be well oiled or smeared with vaseline before passing it into the nostril. It should be passed by slight pushing movements to the back of the pharynx, where it often causes some slight retching. As the tube passes down the Œsophagus to the stomach, these signs of irritation cease. It is known to be taking the proper course by the slight amount of obstruction met with, and also by the length of tube passed. When the stomach is reached air and liquid food are often forced out at the end of the catheter. It is often more easily passed through one nostril than the other, and the erect posture is sometimes more favourable to its passage than the recumbent. When the catheter has entered the Œsophagus or stomach, and signs of irritation have passed, the food should be injected slowly, taking care not to introduce air. On withdrawing the catheter, which should be done rapidly, it is important to pinch the end, so that no fluid may trickle into the glottis and cause cough and possible vomiting. The catheter is more likely to pass into the mouth than the larynx, and then, besides the sensation of obstruction, the child retches a good deal and soon opens its mouth, and the tube may be seen curled up. Cough and retching favour its passage into the mouth. The catheter seldom finds its way into the larynx; should it do so, cough and dyspnoea are excited, and even if these signs were absent the length of tube passed would be a fairly certain indication as to whether the catheter had passed into the larynx and trachea. When the tube is passing easily down the Œsophagus, the whole length may be played out without any sensation of resistance. On the other hand, should the catheter pass into the larynx, it soon meets with obstruction before even half of it has passed.

(To be concluded.)

OVARIOTOMY TWICE SUCCESSFULLY PERFORMED UPON THE SAME PATIENT.

CYST RUPTURED BOTH TIMES.

By CHARLES H. CARTER, B.A., M.D., B.S. LOND,
PHYSICIAN TO THE HOSPITAL FOR WOMEN.

THE narration of the following case is of interest not alone because the operation was twice successfully performed upon the same patient, but also because the cyst or cysts had on each occasion ruptured, and the abdominal cavity was filled with the contents, thereby adding both to the difficulty of the diagnosis and to the gravity of the operation. The cases recorded in which ovariectomy has twice been performed upon the same patient are not numerous. Sir T. Spencer Wells, in his work on "Ovarian and Uterine Tumours" (1882), mentions thirteen as having come under his notice, and in eleven of these he had twice performed ovariectomy, in the other two he had operated the second time. In these thirteen cases the interval that elapsed between the two operations varied from one to eight years. In the case now recorded the interval was three years and a half.

The first operation was performed on June 19th, 1879. The patient was thirty-two years old, had been married ten

years, and had had five children and one miscarriage. She applied at the out-patient department of the hospital for a swelling of the abdomen, which had come on after her last confinement six months ago and was increasing. She was seen by my colleague, Dr. Holland, who diagnosed an ovarian cyst. She became an in-patient under my care. On admission the abdomen was large, distended, but not at all prominent; the recti muscles were widely separated, and on straining (as on raising herself in the bed) the abdominal contents bulged forwards between the separated muscles; the front of the abdomen was dull to about three inches above the umbilicus; both flanks were resonant far back; the resonance was not constant, but varied somewhat as the patient changed her position and at different times of examination, though never absolutely dull; no distinct outline of a tumour could be made out; the abdomen was soft, and the hand could be pressed down to the spine. By vaginal examination the uterus was completely prolapsed, the posterior vaginal wall being pushed outwards and dragging down the uterus. Nothing solid could be felt in the pelvis by vaginal or rectal examination, nor any distinct tumour bimanually. The patient had a strumous aspect; her general health was bad, with facies ovariana; beyond this there was little constitutional disturbance. The temperature was slightly raised at night; pulse quiet. The cyst probably ruptured in the interval before she was admitted as an in-patient. She was kept under observation for a time, during which she slowly increased in size.

At the operation, after cutting through the parietes and reaching the peritoneum, the peritoneal sac bulged forward through the opening, and on cutting through it a thick darkish fluid, very tenacious, poured out. On passing in the hand, the whole abdominal cavity was full of the same tenacious colloid material, portions of which varied in colour from light yellow to dark brown; in the pelvis a hardish mass was felt, consisting of a number of small cysts, and the contracted walls of a larger one which had ruptured. This mass was pulled out of the abdominal cavity, and was attached by a broad pedicle to the left side of the uterus; the pedicle was transfixed and tied in halves, and as a whole, and the cysts removed; a piece of omentum, which was adherent, was tied with silk and separated. The hand then scooped out as much as was possible of the colloid material which lay amongst the intestines and coated the viscera; altogether twenty-one pints of this material were removed. After careful sponging, which could not get away the sticky substance which adhered to the viscera, a drainage-tube was put in, and the wound closed with fourteen silkworm gut sutures. The mass of cysts removed weighed three pounds and a half, consisted of one large proliferous cyst ruptured, and on its walls a number of smaller cysts, many of which were ruptured, and their thick gelatinous contents beginning to exude. The parietal peritoneum was generally thickened and red, that covering the intestines fairly natural. The right ovary natural. The operation was performed under antiseptic precautions and the carbolic spray. The patient did well. The drainage-tube was removed on the ninth day. The patient left the hospital on July 31st quite well. In November, 1880, she came to me complaining of a hardness in the old cicatrix; this eventually broke down, and an abscess formed and broke, leaving a sinus, which ran between the abdominal muscles, and was a long time in closing. She again came to me in May, 1882, and complained of pain and swelling of the abdomen and flatulence. She was regular, and had been so since three months after the operation; the uterus was lower than usual, and a ring pessary was placed; nothing wrong was detected in the abdomen. After this she went into the country, and remained there some time, and again came to me in October saying that lately the abdomen had begun to enlarge, and that she had seen a doctor who sent her back to see me. The abdomen was large and distended, dull in the flanks and in front to within two inches of the ribs. By vaginal examination the uterus was not markedly enlarged, external, and not kept up by the ring pessary; the posterior vaginal wall was much distended and pushed outside. The skin where the incision had been made was very thin and bulging, evidently from fluid. She was admitted into the hospital on November 4th, and she measured 36½ in. at the umbilicus, dulness extending in mid-line 2½ in. above the umbilicus, the flanks resonant, the left less so than the right; no very defined area of dulness, nor any marked evidence of fluid in a cyst; the resonance in the flanks varying; fluctuation could be made out, though obscurely. On November 18th the umbilical measurement

was 39½ in. The diagnosis, at first somewhat obscure, was made easier through former experience, and I concluded that the ovary in the right side had become cystic and ruptured; there was but little constitutional disturbance beyond that arising from the increasing size and weight of the abdominal contents, and her chief complaint was the extrusion of the uterus and posterior vaginal wall, which did not go back on lying down, nor could be kept back by any pessary.

The second operation was performed on November 30th, the patient having ceased to menstruate on the 27th. The incision was made half an inch to the right of the old cicatrix; the abdominal walls were exceedingly thin, consisting merely of skin. On reaching the peritoneum it bulged forwards, and on opening it thick colloid material poured out, and the diagnosis was clear that the cyst had ruptured. The incision was enlarged, and the contents of the cavity pressed out, and then the hand passed in and scooped out the jelly-like substance. In the pelvis a number of ruptured cysts were felt and pulled forwards and separated from a larger mass below, and then the larger mass was pulled out and found attached to the right side of the uterus by a thin broad pedicle. This was transfixed and tied in halves and as a whole, and the cysts removed. The abdominal cavity was then cleared of the colloid material, the hand scooping it out and exploring under the liver, stomach, flanks, &c. After sponging and getting away all that was possible, a drainage-tube was placed and the wound closed by ten silkworm gut sutures. The intestines were fairly natural in colour, and the parietal peritoneum reddened. The colloid material removed weighed twenty-five pounds, and measured twenty-three pints; it varied in colour from canary-yellow to dark olive-green, and presented a strange appearance, nearly filling a large foot-bath, from the mixture of the different coloured masses of jelly-like material, and showing that a large number of cysts had been ruptured. The cyst walls weighed two pounds and three-quarters, and consisted of a great many thin-walled cysts varying in size. The stump of the pedicle at the first operation was felt as a hard nodule about the size of a pea at the upper border of the left broad ligament. The operation was conducted under antiseptic precautions and the carbolic spray. The patient did well; the drainage-tube was removed on the sixth day. A discharge of ascitic fluid continued from the opening left by the tube for some weeks; at first this was rather abundant, and then became purulent, and a sinus remained, down which a probe passed three inches; this very slowly closed. She was discharged on Jan. 30th, 1883, the opening still present for about an inch and a half. She was seen about a month after this, when the wound was found perfectly healed and the patient in good health.

I have met with a third example of ruptured cyst where a large quantity of colloid material filled the pelvis. A patient, sixty years old, single, was sent to me in October, 1881, by Mr. Sharpin of Bedford. She had noticed a swelling in the lower part of the abdomen about twelve months previously, it remained much the same size for six months, when it began slowly to enlarge. At this time she had a falling of the womb, which came on quite suddenly without apparent cause, the uterus, and especially the posterior vaginal wall, being pushed out. When I saw her the abdomen was distended by a tumour which reached to within three inches of the ensiform cartilage, both flanks were resonant, though on the left side the dulness extended far back. By vaginal examination the uterus was completely prolapsed with a large bulging rectocele; when replaced it at once returned. After being under observation a few days she complained of great pain in the prolapsed part, which was more distended; she had great difficulty in passing water, the abdomen became fuller and tender, and the temperature rose gradually in three days to 102°6, and the pulse to 116; after three or four days it fell to normal. On Nov. 7th, when the febrile attack had passed, I operated. On opening the peritoneum a quantity of straw-coloured colloid material escaped. The cyst was thin walled, and the contents were too thick and tenacious to flow through the trocar; it was therefore removed, the cyst pulled forward, and the contents taken out by the hand. There were no adhesions, and the cyst was attached to the left side of the uterus by a broad pedicle, which was ligatured and cut short. The pelvis was full of the colloid material, and after emptying it the prolapsed uterus, &c., were pushed back. A large quantity of the colloid material was taken

from the abdominal cavity, and after careful sponging the wound was closed by silkworm gut sutures. The peritoneum, parietal and visceral, was very red and inflamed, in some places granular-looking. The cyst and its contents weighed 19 lb. The operation was performed under antiseptic precautions, and the carbolic spray was used. The patient did very well. The temperature was once 100° 2', on the evening of the first day, and the pulse 104. In this case it may be assumed that the sudden coming on of the prolapsus marked the time when a cyst ruptured, and that the pressure of the contents filling the pelvis led to the marked protrusion of the posterior vaginal wall. There was most probably a second rupture of some cyst at the time when she had the febrile attack, just before the operation, and when a larger quantity of fluid was poured into the general cavity of the abdomen. In the three instances recorded this protrusion of the vaginal wall was a very marked symptom.

Great Cumberland-place, W.

A CASE OF HEMIPARAPLEGIA SPINALIS; WITH REMARKS ON MUSCULAR SENSE, ETC.

By JAMES MACKENZIE, M.D.

(Concluded from p. 997.)

BROWN-SÉQUARD may now be considered to have fully established the method of recognising a one-sided lesion of the cord by the very definite symptoms presented during life. The case I have detailed undoubtedly comes under the class of one-sided lesions, though, as in the matter of increased tendinous reflexions, there is probably some slight affection of the opposite side. I would more particularly direct attention to the muscular sense and the urinary and rectal reflexes, which present some features either at variance with, or not exhibited in, other cases; in part it may be due to the locality of the lesion.

Muscular sense.—Brown-Séquard, inferring from the cases studied by him, places the course of the muscular sense as accompanying the motor nerves. He has been implicitly followed in this statement by recent authors, as Erb, Ross, Gowers, Poincaré, Bramwell, &c. There is, to my mind, but a small portion of the truth contained in this statement, inasmuch as this sense is of a complex nature, and depends not upon afferent nerves alone for its transmission. By experience we learn to exercise a definite amount of muscular force in the accomplishment of any known act. When, therefore, we seek to raise with the hand any given weight, we are cognisant of the amount of nervous discharge employed to stimulate the muscle. The completion of the act or otherwise is made known to us by the afferent nerves, their terminations being affected by the change of position, &c. Thus in a case of hemianæsthesia, the hand of the affected side being held and the patient's eyes closed, if the patient be requested to put that hand to his head he will immediately put in action the required muscles, and be under the impression that the act has been accomplished, although the hand has been retained in its original position. Seeing that all sensation had disappeared on that side, the impression that the patient got was derived from experience, which taught him that the voluntary discharge of so much nervous energy was followed by a known result. So again with my patient. A few ounces on his leg did not obstruct its rising much, and the cutaneous sensation being intact he came to a fairly accurate conclusion. But when five pounds were placed on it, then he had to exercise more energy and strongly will a greater discharge, and the sensory nerves informing him that he failed to lift it he became confused, and attributed to the weight properties that experience had taught him to associate with this amount of nervous discharge. Thus, we have in the constitution of muscular sense two conditions affecting our consciousness—namely, motor feelings proper and sensation proper, as expressed by Professor Bain. The one is associated with energy passing outwards, the other with stimulation passing inwards; the two facts mingle together in the stream of mental life, but are yet of a widely different nature.¹ This "motor feeling" is a sensation which accompanies muscular movement, "coinciding with the outgoing stream of nervous energy,

and does not, as in the case of pure sensation, result from any influence passing inwards by incoming or sensitive nerves."² The parts constituting the muscular sense may be illustrated by the following diagram. *cc* represents the

centre of consciousness, being affected by the discharge, in obedience to the will, taking place at *m.c.*, motor centre, on the one hand, and by peripheral stimulation passing upwards through *s.c.*, sensory centre, on the other. Here, then, as I take it, the due appreciation of the part played by "motor feeling" is a result of experience. When any given act is to be performed, the amount of discharge of nervous energy is regulated according as experience has taught what amount of energy would overcome the resistance. Thus several weights externally similar are placed before me—say, five are of six pounds burden and one of one pound. In lifting each of the five I exert the same amount of force. When I come to the one pound, thinking it is equal in weight to the others, I consciously liberate the same amount of energy as before, and the sensory nerves inform me of the result, and by putting together the knowledge of the amount of the cerebral nervous discharge (motor feeling) and the sensory peripheral impressions, I come to a conclusion regarding the weights of the diverse bodies, the whole process constituting the muscular sense.

While this explanation accounts for the aberration of the muscular sense in the paralysed limb, why has there not been noticed an interference with the sense in the limb when sensation alone was affected? The assumption of Brown-Séquard, and those who have followed him, that the muscular sense was conducted by motor paths, is militated against by analogy and several established facts. In the matter of analogy, it would require strong proofs to believe that motor paths convey sensory impressions. I will be content with quoting two instances in objection. The first is the case quoted by Sir Charles Bell and given by Brown-Séquard in his lectures,³ where in a typical spinal hemiplegic the muscular sense was undoubtedly gone on the side retaining muscular power, but profoundly anæsthetic. In a case quoted by Erb, abolition of sensation was accompanied with loss of muscular sense, yet retention of muscular power, when at the autopsy the motor paths were intact in the spinal cord.⁴ At one time in my case, when there was profound anæsthesia, there was undoubted absence of muscular sense. Further, in most of the recorded cases anæsthesia has been said to exist when the patient failed to detect separate points within a certain distance; text-books give this as the method of testing the anæsthesia. I have made out clearly in my case that while the patient cannot tell that two points are touching him when from eight to twelve inches apart, thinking there is but one point, and that midway between them, yet the slightest touch with a fringe of cotton he immediately recognises and accurately locates. I would be inclined to associate the conservation of the muscular sense with the retention of delicate touch and their simultaneous disappearance; and also that when there is retention of muscular sense in the non-paralysed limb, the lesion does not entirely interfere with the functions of the one side of the cord.

I would next call attention to the urinary and rectal conditions. I have not come across a parallel condition, and it may in a great measure be due to my patient being a man of resource. In the first described method the patient enjoys

¹ Senses and Intellect, 3rd edition, p. 74.

² Lib. cit., p. 77.

³ THE LANCET, vol. ii., 1863, p. 822.

⁴ Ziemssen's Encyclopædia, vol. xiii., p. 89.