static electricity acts is to conserve the nerve-force, which is the strength of life, in the centres; at the same time sensibly relieving that most distressing feeling of exhaustion, which is, in itself, a fruitful source of mischief in the emergency—by the mental depression it produces, and the consequent loss of the aid of the cerebral centres in prolonging life. It is probably needless to point out that the patient can be fed with a wooden spoon or porcelain feeder, ordinary care being taken not to make contact, by any conductor, with the ground. Obviously, this suggestion only relates to an adjunct to the treatment of fever, in an emergency which arises in no small proportion of cases, and which is most embarrassing to the practitioner, as well as perilous to the patient. It is, however, of more than sufficient promise to warrant a trial.

ON A CASE OF GASTROSTOMY: WITH REMARKS ON THE OPERATION.¹

By THOMAS F. CHAVASSE, M.D. EDIN.,
Surgeon to the Birmingham General Hospital.

JAMES F., aged 52, was admitted into the General Hospital, Birmingham, on July 8th, 1883. There was no family history of malignant disease. He had always appeared a healthy man until six weeks before admission; it was then noted that difficulty attended the swallowing of solid food; a month later, solids could not be made to reach the stomach.

On admission, the patient was somewhat haggard and worn-looking. On attempting to swallow milk, there was an evident oesophageal obstruction. A sound passed into the gullet was arrested eight inches from the teeth. Gentle manipulation, with sounds of various sizes, failed to pass through the stricture. After the attempts so made, swallowing greatly improved; so much so, that a slop-diet and very finely minced meat could be taken with a little difficulty. The patient thereupon declined any operative measures.

In October, the man was readmitted to the hospital, the oesophageal obstruction being complete, and no solid food passing to the stomach. The sound failed to relieve. The patient's weight was 6 st. 10½ lbs.

On October 30th, the first stage of the operation of gastrostomy was performed, the soft parts of the abdominal wall being divided by an incision four inches long, commencing opposite the ninth rib, and drawn parallel to the edge of the left rectus muscle. The peritoneum was opened half an inch externally to the linea semilunaris, and the anterior wall of the stomach at once exposed. A silver wire-suture was passed in a longitudinal direction through the outer coats of the stomach, cut long, and its ends left projecting about the middle of the parietal incision. This suture had for its object the drawing forwards of the stomach-wall. Silk-sutures, threaded and used as in ovariectomy, were then passed transversely through the peritoneal and muscular walls of the viscus, and through the whole thickness of the abdominal parietes, three-quarters of an inch beyond the edges of the primary incision. Two were passed above, and two below, the wire-suture. These four silk-sutures being tightened, the stomach was kept in contact with the abdominal wall, and the edges of the parietal incision were brought into direct apposition, as though union by first intention were required. The silver wire-suture was left projecting considerably beyond the abdominal wall. The operation was conducted antiseptically, without the spray. Ether and chloroform were used as anaesthetics. The patient was ordered to be fed by peptonised enemata every four hours.

On October 31st, marked bronchitis was developed. Teaspoonfuls of egg-flip, and of milk and lime-water, were ordered to be given alternately by the mouth every second hour. The pulmonary condition subsequently improved, but never got quite well.

On November 2nd, the wound was dressed, and the second suture removed. Two days later, the third suture was removed; and the day after, the remaining silk stitches were taken away.

On November 8th, the second stage of operation was done. The stomach was opened by a very small oblique incision, just internally to the wire-suture. Two ounces of warm milk were injected into the viscus, through a piece of catheter which was left *in situ*. The whole proceeding caused no pain. The next day, the patient complained of severe pain in his stomach, and the bronchial irritation was much increased. Gastric juice was abundantly poured out into the dressing.

On November 10th, he had severe coughing all night, and, in the

morning, a small piece of omentum was found to have been forced through the lower part of the wound.

The day following, the permanent wearing of the tube in the stomach was discontinued, and the wire-suture was removed. The withdrawal of the tube considerably diminished the bronchial irritation. The patient was now fed four times daily, through the gastric fistula, thrice with an egg and four ounces of milk, and once with the finely minced meat from a chicken's breast. His weight on November 14th was 5 st. 10½ lbs. The patient at this date got up regularly, and went about the ward. Both appetite and digestion were good. A week later, his weight was 5 st. 8½ lbs.

On November 28th, the report says that, owing to the patient having gone into a cold passage, he had coughed all night, and in the morning his expectoration was bloody, and pneumonia of the right lung existed. Late in the afternoon of the same day, death took place quite suddenly.

Post mortem examination, sixteen hours after death. The body was much emaciated. There was hepatisation of the upper lobe of the right lung. The trachea was adherent behind to the oesophagus, but there was no direct communication between the canals. Immediately above the aortic arch, a very tight stricture of the oesophagus, caused by a new growth, commenced; and the remainder of the tube, as far as the stomach, was implicated by this neoplasm. Microscopically, the growth was found to be epitheliomatous. The stomach was attached to the abdominal wall by firm adhesions, surrounding for three-fourths of an inch an artificial opening in its anterior wall. A small piece of omentum passed between the stomach and the anterior abdominal wall, and appeared externally as a granulating surface. A mass of invaded glands existed near the cardiac orifice, one of which was suppurating in the centre.

REMARKS.—In the record of this case, I would direct attention to the mode of securing the stomach. Four silk-sutures only were used; and the organ was drawn up, as it were, to the surface, and the edges of the wound then approximated by the same stitches. Adhesion readily took place, while the wire-suture was a sufficient guide for making the necessary opening into the viscus.

The exact method of fixing the stomach in this operation is variously advocated. With some surgeons, a tedious method of inserting a double row of sutures is preferred; this plan is probably most serviceable when it is necessary to speedily undertake the second step of the operation; but if five days, or a week or more, are to be allowed to pass before the opening is made, it would appear to be an unnecessarily tedious procedure.

In a case in which one of my colleagues completed only the first portion of the operation, the stomach was secured to the edges of the skin-incisions on each side by short silk-sutures. Pneumonia proved fatal on the fifth day, and yet, at the *post mortem* examination, even in a weakly, worn-out patient, adhesions were found which would have been sufficient for practical usage.

Mr. Howse, whose name will always be associated with this operation, has of late endeavoured, and with success, to obtain the necessary adhesions without using any sutures at all. In answer to a letter, Mr. Howse, with great kindness and courtesy, has given his consent to my publishing his present method. I cannot do better than use his own words in reference to his last case. "The plan I adopted was the outcome of many experiments in colotomy and other abdominal operations. In colotomy, I never make use of a suture now. In this case of gastrostomy, I simply used two forceps, clamping the stomach, but not so tightly as to cause sloughing. The two forceps had each of their blades sheathed in thick rubber, and were put on the stomach at different levels, so that an interval was left between them, by which the blood-supply might pass as freely as possible.....They (the forceps) were taken off on the sixth and eighth days, and the stomach not opened until the tenth day." Mr. Howse goes on to say that the length of time allowed to elapse between the first and second steps of the operation was unnecessarily long, but was thought advisable in a first case performed after the manner detailed. The incision through the soft parts, Mr. Howse writes, "was my usual one, through the skin parallel with the costal cartilages, through the rectus muscle vertically, separating but not cutting the fibres, so as to make a kind of sphincter muscle." It seems, therefore, that, for the present at all events, the exact mode of securing the stomach must be decided by the condition of the patient and the date at which the organ must be incised for feeding purposes.

Between the first and second steps of the operation, nourishment by the mouth was not altogether forbidden; in fact, each day there was a tendency to increase the quantity administered, provided that the swallowing of the same were not too painful or too tedious. This procedure exercised a marked benefit, by diminishing the sensations of

¹ Read before the Birmingham and Midland Counties Branch.

thirst and hunger. The opening into the stomach was an oblique one, a few lines long, made from above downwards. The object was to endeavour to form a valve-shaped orifice; for, during feeding in these cases, food is very apt to regurgitate by the side of the introduced tube, and the gastric juice escapes freely. The attempt made to remedy this evil proved futile.

During an operation for gastrostomy, when the peritoneal cavity has been opened, it is somewhat surprising to find how easy it is to be deceived with regard to the part of the stomach seized and drawn forwards. In the instance under notice, it was most certainly thought that the organ was secured and the opening made much nearer the splenic than the pyloric end; but, after death, the orifice of the fistula was found to be nearly equidistant from the two ends. By drawing the stomach partly out through the wound, the question could doubtless be more properly decided; but the prolonged manipulation of the contents of the abdomen is to be avoided, especially when it does not seem to make much material difference where the anterior wall of the stomach is incised.

The operation of gastrostomy may be said to have two objects in view: 1, to diminish the sufferings of the patient; 2, to endeavour to prolong life. Practically, the first is more important. Those affected with malignant disease of the œsophagus, do not, as a rule, suffer materially until the growth is sufficiently advanced to cause difficulty in swallowing food. Doubtless the passage of the more solid particles of nourishment down the gullet induces more or less irritation, and a consequent increase in the rate of growth and the size of the neoplasm. Laryngeal irritation, followed by ulceration of the trachea, supervenes, and septic pneumonia generally terminates existence. By the performance of this operation early in the disease, the patient is in a condition in which operative interference is more readily borne; the food being introduced directly into the stomach, the irritation and the rate of the growth are lessened, and the symptoms generally are less severe. It is upon these facts that the utility of the operation exists. With regard to its prolongation of life, statistics do not offer much encouragement. In the *Archives Générales de Médecine*, for November, 1883, M. Blum has collected and tabulated 106 cases in which the operation was undertaken for malignant disease of the œsophagus; of these, 50 lived for more than one week. In 13 instances the duration of life was as follows: 3 patients lived for three months; 4 for four months; 3 for six months; 1 for seven months; 2 for eight months. The remaining 37 cases proved fatal between the beginning of the second and the end of the eleventh weeks.

Probably, with the growth of knowledge and increased experience, the results of this operation in cancer will soon be of a much more favourable character. Blum's tables of the last few years afford sufficient evidence on this point; and eventually it may be the recognised practice to advise the formation of a gastric fistula much earlier in the disease than is now the custom with the majority of surgeons.

THE CAUSATION OF TROPICAL HEPATITIS: WITH NOTES OF FOUR CASES OF ABSCESS OF THE LIVER.

By E. O. MILWARD, M.A., L.R.C.P. & S.Ed.,
Surgeon Army Medical Department.

THE commonness of liver-affections amongst British soldiers serving in India may be attributed to over-stimulation by food and drink, aided by the effects of climate; the latter including sudden changes of temperature, malaria, and excessive long continued heat. They are much less frequent amongst natives, presumably in consequence of the light unstimulating nature of their diet, and because in them, probably from acclimatisation, intense heat produces less visceral congestion.

That heat, chills, and malaria are not, however, the sole factors in the production of this class of diseases, may be inferred from a comparison with the case of other residents in India of a different European nationality.

Dr. Jules Rochaud (Art. "Climate," in the *Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques*) has recently stated that inflammation of the liver is scarcely known in the Indian possessions of the French; and other observers (Friedel, for example, in his work on *China*) have made similar statements on the comparative immunity from liver-disease enjoyed by non-English residents.

During the hottest months of the year, the young unseasoned soldier lives on a liberal ration: far more liberal, in many cases, than that to which he was accustomed in the days before his enlistment in his

native land, and he drinks freely of the strong heady beer of Indian manufacture.

Languor and the fierce heat of summer prevent him from indulging in out-door exercise, except to a very limited extent; the result being that the ingestion of a large quantity of meat and drink tends to plethora, disorder of the digestive organs, and faulty assimilation. Thus, increased labour is thrown on the liver, already congested from climate, and working at full pressure in eliminating waste products, and in compensating for the diminished excretion of carbonic acid through the lungs, the consequences of breathing a less oxygenated atmosphere, of slower respiration, and of lessened vital capacity.

Confined in the close heated atmosphere of barrack-rooms nearly the whole day, mentally and bodily inactive, eating and drinking more than he can assimilate, or than is needed for nutrition, the sum total of the conditions under which he passes his existence in the plains, in the hot weather, resemble in many points the process which the Strasburg geese undergo, when their livers are prepared by disease for *pâtés de foie gras*.

It is not argued that animal food is unnecessary at this season, but that it should be consumed more sparingly than in the cold weather. There are many vegetable foods in India which contain as much nitrogenous principles as lean meat, such as dalls, beans, peas, wheat, etc.; and it would be advisable to take the nitrogenous portion of our food chiefly from these, because they are less stimulating, and can be assimilated with less excitement to the economy. If food be intended as a balance between work and waste, the amount and nature of the soldier's ration call for modification in the period of the greatest heat, as compared with that which is necessary in the season of the opposite extreme. The amount should be enough to balance the work done, and calculated on the knowledge that the process of digestion and assimilation is slower in the hot weather, because of the lethargy of the vital functions; and as for the kinds of food, they should be such as would most readily fit in with the conditions entailed by tropical life.

Nutrition would not be likely to suffer by the change; habit, however, in most things becomes a second nature; the soldier is very tenacious of his rights, and very probably would be slow to recognise the soundness of the principle involved. Accepting, then, that hepatitis is caused by a chill in a person whose liver has been congested by residence in a hot climate, aided by intemperance, irritating ingesta, and exposure to malaria, the most hopeful measures of reducing its mortality appear to be such as would tend to counteract these injurious influences.

If the British troops, wholly or in good part, were withdrawn every year to the hills at the end of March, and sent back to the plains in the middle of October, it is fair to assume that hepatitis, and the other diseases to which they are incident by reason of their residence in an unnatural climate, would disappear in time; but in this, as in many other cases, it is easier to point out than to apply the remedy. The question of military expediency arises, and the measure would be pretty certain to meet with disapproval, because of the expense it would entail.

The following are notes on four cases of suppurative inflammation of the liver which occurred amongst the British troops in garrison at Umballa during the year 1883. Of these, three cannot be attributed to dysentery, to pyæmic origin, or to mechanical injury. One of them proved fatal, but no traces could be found in the intestines of cicatrices or of recent ulceration. In the remaining case, pyæmic deposits were found in the liver, and ulceration of the ascending colon close to the cæcum coexisted. With this exception, they were all probably the result of climate, aggravated by injudicious eating and drinking. Two of the four cases proved fatal; the remaining two recovered, one by spontaneous evacuation, the other by surgical interference.

CASE I.—The first of these (Private J. T., Leinster Regiment, aged 40, service 21 years and 1 month, Indian service 3 years and 11 months), was multiple and secondarily pyæmic, resulting from the absorption of septic matter from an ulcerated colon. Diagnosis during life was beset with many difficulties. There were undoubted symptoms of hepatitis and bulging below the costal margins, with great pain extending below the umbilicus, the most prominent part being situated between the mammary and axillary lines. A free incision was made into this swelling, a large quantity of pus was evacuated, and two lower openings were made later on, so as to allow free exit of discharge. It was believed during life that these openings led directly into a large liver-abscess; but, on the *post mortem* examination being made, they were found to pass into an artificial cavity formed by the right lobe of the liver, the colon, and the walls of the abdomen; all these, with the adjacent structures, being matted together. The ascending colon presented a ragged opening about two inches from the cæcum, opposite to and corresponding with the gangrenous infiltration of the abdominal