dorsal vertebra, sometimes on the right and sometimes on the left of the spinal column. Repeated experiments with two tubes—one in the stomach (perforated) and one in the œsophagus—as described above, showed that the fluid wholly escaped from the œsophagus into the stomach, and this was corroborated by the “coffee experiment.” The capacity of the dilated œsophagus appeared to be about half a pint. No swallowing sound could be heard at the end of the sternum or in a corresponding position over the spinal column. The temperature was generally slightly elevated (99° to 100° F.).

The diagnosis of œsophageal dilatation was formed on the following grounds: (1) The ease with which the tube could be passed into the stomach; (2) that in order to empty the second “cavity” it was merely necessary to withdraw the tube some inches from the stomach; (3) the positive result obtained by the “two tube test” and “coffee experiment”; (4) the absence of the swallowing sound.

The only other conditions which could give rise to difficulty in the diagnosis would be malignant disease and diverticulum of the œsophagus. Malignant disease could easily be excluded by the duration of the case and the absence of stricture, for a malignant growth which has not caused definite stenosis never gives rise to dilatation of the œsophagus. Diverticulum of the œsophagus could also be excluded by the various tests which have already been mentioned, by the ease with which a tube could invariably be passed into the stomach, by the absence of the swallowing sound, and by the fact that the œsophagus could be emptied by merely withdrawing the tube some distance from the stomach without pushing it on again into a definite pouch.

The treatment has not proved very satisfactory. Feeding with the stomach tube has failed after repeated trials before the patient came under observation. Electricity (one rheophore being placed in the œsophagus) and tonics—with a view to overcoming the atony of the muscular tissue—have given no relief. A comparative degree of comfort only has been obtained by the ingestion of soft foods and the systematic lavage of the dilated œsophagus.

The question of gastrostomy has been considered but has not been thought desirable so long as the patient is keeping up her nutrition.

SUCCESSFUL OPERATION FOR PERFORATED INTESTINAL ULCERATION IN TYPHOID FEVER.

By FRANCIS T. HEUSTON, M.D., F.R.C.S.I.,

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WHEN the number of deaths which occur annually as the result of perforation of intestinal ulceration in connection with typhoid fever is taken into consideration, and the absolutely hopeless result of medical treatment in such cases, any method whereby this fearful mortality, amounting to from 90 to 95 per cent. (Murchison), can be lessened must be received with gratitude by the profession. From the results already obtained by surgical treatment of those cases many valuable lives have been saved, and I believe we are justified in considering that another has been added to the many recognised abdominal operations.

On September 6th, 1900, I was requested by my colleague, Dr. Wallace Beatty, to see a married lady, aged 34 years, who had been under his care for typhoid fever, which had run its course without any special characteristic, the temperature falling to normal on September 2nd, when she was considered convalescent.

On the morning of September 6th there was nothing to indicate the imminence of any complication, but about noon she was seized by sudden severe pain in the abdomen, followed by rigors and evidence of collapse, her pulse rapidly rising to 160 and her temperature to 104° . The abdomen became somewhat distended, but was soft and not increased in tension; a tympanitic percussion note was obtained over the hepatic area.

Perforation was diagnosed, and at 4.30 P.M., assisted by Mr. Gordon, I made a median incision between the umbilicus and pubes. On opening the peritoneal cavity a quantity of dark brown-coloured fluid, evidently due to extravasation of the intestinal contents, exuded, and as the intestines were raised from the pelvis, this region was found to be filled with a similar fluid, in which the intestines floated. The small intestine was now examined from its termination at the cæcum, when it was seen to be very congested and vascular. As the ileum was traced upwards it was found covered by lymph, about 8 inches above the cæcum, on the removal of which a pin-hole opening was discovered, from which the intestinal contents were oozing. This was marked, and as the amount of extravasation appeared very large to come from so small an opening, within the five hours which had elapsed since the symptoms pointing to perforation had occurred, the rest of the ileum was rapidly examined,

when, although another portion of the intestine, about a foot above this, was also covered by lymph, and presented evidence of a large ulcer, no perforation could be found, and as above this the congestion and vascularisation of the intestine gradually ceased until it presented a normal appearance, it became evident no other perforation existed.

The seat of perforation was then dealt with, a continuous silk suture passing through all the coats of the intestine, except the mucous, being applied and the edges of the perforation and ulcer inverted. Over this sufficient Halsted sutures of catgut were applied to enclose the thickened area corresponding to the ulcer, thus including it within the inverted portion of the intestine. The peritoneal cavity was then thoroughly flushed out by normal saline solution to remove the extravasated intestinal contents, when the abdominal wound was closed, no drainage being employed.

During the night after the operation, the temperature fell from 104.2° F. to 98° F., and the pulse from 160 to 118. The following day the temperature gradually rose to 101.4° F. and the pulse to 142, and towards the evening a movement of the bowels occurred, after which the temperature gradually fell, becoming normal on the following evening, when the pulse had also fallen to 82. The subsequent history of the case was uneventful, no complication arising. When I recently heard of the patient six months after the operation, she was in perfect health.

Hare in his work on *Complications of Typhoid Fever*, published in 1899, records 103 cases in which operation had been undertaken for perforation in typhoid fever; of those 21 recovered, giving a percentage of 20.38, which must be considered favourable, when compared with the pre-existing rate of mortality, as, although we cannot look on this as a true record, many unsuccessful cases, I am certain, not having been published, still, we must place on the other side the fact that many of the earlier cases operated on were such as would not have been operated on had the circumstances under which successful result was to be expected been as well understood as it is now.

It has been shown that a most important factor in the result to be obtained in this variety of perforation, as in every other, is that of the time which has elapsed between the perforation and the operation. Of the cases operated on after an interval of twenty-four hours had elapsed from the perforation practically all were unsuccessful (one recovered twenty-six hours after and two between the second and third day), while of the cases operated on within twelve hours a percentage of 26.7 recoveries were obtained; and of those operated on between twelve and twenty-four hours 30 per cent. of recoveries resulted.

In the United Kingdom this operation does not appear to have obtained the recognition it deserves, as I have only been able to find about 20 cases recorded, with, however, the satisfactory result of four recoveries, and believe it is only necessary that physicians should be aware of the success to be expected to submit their cases more frequently to operation, when I confidently look to 50 per cent. of the cases being successful.

TWO CASES OF POST-OPERATIVE THROMBOSIS OF THE MESENTERIC VESSELS FOLLOWED BY DEATH.

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As a sequel to operation, thrombosis of some venous trunk more or less remote from the sphere of treatment is not uncommon; and is perhaps more frequently met with in the external iliac or common femoral than in any other. I do not recall having previously encountered in my own experience a case where, after operation, the mesenteric vessels became thrombosed. Yet strangely enough, in that peculiarly inexplicable order of things, not unfamiliar in the practice of most men, where rare and interesting cases sometimes come in runs, it was my lot to see two deaths from this particular complication within four days of each other.

In the first case a fatal result ensued four days after the performance of gastro-jejunostomy for pyloric obstruction; and in the other, three days after removal of the left half of the thyroid gland for exophthalmic goitre. Both cases presented striking features of similarity; so much so that in the second case, Dr. John Duncan, my resident infirmary assistant, who was cognisant of the facts associated with the first, rightly interpreted the symptoms connected with the second. Aside, therefore, from the pathological interest attached to the direct causes of death it seemed to me that

the cases were sufficiently instructive from a purely clinical aspect to make them worthy of being recorded.

I will relate the history of the two cases before discussing the subject further and indicating the special features of interest associated with them.

CASE I. Gastro-jejunostomy for Symptoms of Pyloric Obstruction; Death on the fourth day from Thrombosis of the Mesenteric Vessels.—Miss X., aged 26, was a patient of Dr. Shiels, Glasgow, by whom I was asked to see her.

History.—Her symptoms, dating back for 2½ years, were mostly gastric in character and pointed unmistakably to some obstruction at the pylorus. There was a ventricular systolic murmur with a well marked *bruit de diable* in the veins of the neck. Her pulse was invariably rapid and frequently registered 120. She was anxious that something operative should be undertaken to relieve her of the incessant vomiting which always followed after taking solid food.

Operation.—On July 4th, 1901, in St. Elizabeth's Private Nursing Home, with the assistance of Dr. Grant Andrew and Dr. Russell, with Dr. Holm Henderson as anesthetist, I performed gastro-jejunostomy without any difficulties. Anastomosis was effected by stitching. The patient took the anæsthetic well and the operation, which included a preliminary exploration of the stomach, was completed in fifty minutes.

After-History.—After the operation the patient was somewhat restless with rapid pulse, otherwise she seemed well. On the second day flatus was passed *per rectum*. On the third all seemed to be going on well till the afternoon when she became extremely restless, tossing herself about so violently that she had to be forcibly held in bed. The nurses in charge thought the patient was hysterical in her behaviour. On the fourth morning pain was complained of in the lower part of the abdomen where there was also tenderness on pressure. The injection of nutrient enemata caused great pain and were immediately expelled. There was no abdominal distension and no parietal rigidity. Wind was occasionally belched up, but there was no marked vomiting. There was continued great restlessness accompanied with considerable breathlessness. The pulse was very rapid and weak. Features much sunken in aspect. The patient died from increasing exhaustion.

Post-mortem Examination.—As no permission was obtained for a general post-mortem examination Dr. John Duncan made an examination of the abdominal contents through the original parietal incision. The substance of his report was as follows: Everything connected with the operated-upon parts of the stomach and intestine were in a perfectly sound and healthy condition, there was not the slightest evidence of peritonitis anywhere. On tracing the small intestine downwards it was found perfectly healthy until the last 3 feet of the ileum were reached. These 3 feet were of a dark purple colour. The involved gut itself was empty and collapsed. The mesenteric vessels in connection with it were found to be thrombosed as far up as they could be seen and felt in the mesentery. The great bowel, appendix, rectum, uterus, Fallopian tubes, ovaries and bladder, were examined but presented no abnormality.

CASE II. Excision of the Left Half of the Thyroid Gland: Death three days after the Operation from Thrombosis of the Mesenteric Vessels.—The patient, Mary Y., aged 28, a governess, was under the care of my colleague, Dr. Ebenezer Duncan, in the Victoria Infirmary.

History.—She was being treated for exophthalmic goitre accompanied with the usual symptoms. The following remarks are abstracted from the report of her case when admitted into the medical ward. "A distinct thrill is felt over the vessels of the neck. On auscultation a roaring ventricular systolic murmur is heard. A fainter ventricular systolic is heard over the tumour. Ventricular systolic heard down the sternum (getting fainter) and over the whole cardiac area. Second sound rather wanting in sharpness. Pulse is very weak and soft and numbered 126 per minute."

Operation.—On July 9th, 1901, at the request of Dr. E. Duncan, and with the assistance of Dr. Grant Andrew, Dr. Russell and Dr. John Duncan I excised the left half of the gland. The removal was effected with very little loss of blood, and the patient rallied well and rapidly from the operation.

After-History.—During the night of the operation she became very restless and excitable, but this was attributed by the nurse to the excessive heat of the season.

July 10th.—During the morning the bowels became very loose and fluid motions were passed, one of which was noted to be distinctly tarry in colour and believed to contain blood. The succeeding motions were of a greenish colour. In the afternoon she began to complain of pain at the lower part of the abdomen, unaccompanied with tenderness on palpation or with any distension or rigidity of the parietes. She was not troubled with vomiting, and nourishment in the form of milk was taken freely. Her most marked symptoms were increasing restlessness and excitability; so much so that those in charge considered she was simply hysterical. Her temperature, which the day before had risen to 100.8°, now began to fall; and the pulse, always more or less rapid, became increasingly so and more feeble. These symptoms continued until the next morning (12th), when the patient died at 4.30 in a collapsed condition. Nourishment was well taken up till death. Towards the end the abdomen showed some signs of distension.

Necropsy.—The necropsy made by the pathologist, Dr. Anderson, revealed the following conditions: The ileum from about its commencement to the cæcum was of a dark purple colour, almost black at parts, and here and there showed evidences of sloughing. General distension, with a smooth shiny appearance of the serous coat, was, however, the most marked condition of the gut. On opening the ileum, its contents were found to be fluid blood and undigested food. The mesenteric veins were thrombosed, and numerous hæmorrhages were visible beneath the peritoneum. The heart was small, soft, and pale; no valvular lesions. The lungs were congested and full of œdema; the bronchi were markedly injected. The liver was soft and anæmic, with small superficial hæmorrhages. The spleen was passively congested. The kidneys were small, but pale on the cortices.

In reviewing these two cases together the following points of similarity appear in connection with the clinical symptoms. Both patients were females, and of about the same age—one

26 years, and the other 28 years. In both there was a ventricular systolic murmur; in both there was rapidity of the pulse as a symptom prior to operation, and a continuance, with increased rapidity, after operation. In both there was excessive excitability occurring on the second and third days after the operation, which, although the patients were in different institutions and under different capable nurses, were considered by these as symptomatic of hysteria. In both the pain at the lower part of the abdomen suggested commencing peritonitis, but in neither were there other symptoms typically suggestive of it. In both cases death occurred at pretty much the same interval of time after operation; and in both the mesenteric vessels connected with the ileum were the ones found thrombosed. In both the wounds connected with the operations were perfectly healthy.

The following were the points of dissimilarity: In the pyloric case, although flatus was passed, there was no passage of fluid motions containing blood, as in the exophthalmic. A marked feature in the pyloric case was the great pain caused by any attempt to inject, *per rectum*, nutrient enemata. Immediate expulsion followed the effort. A marked difference existed in the extent and degree of involvement of the bowel; in the pyloric case only about three feet of ileum were congested, the bowel was collapsed, and did not contain blood; in the exophthalmic case the whole ileum was implicated, densely congested, ecchymosed, distended, and in places showed signs of sloughing, and in its interior contained fluid blood.

It will thus be seen that the points of similarity were more in evidence than those of dissimilarity, but whether these former can be taken as merely coincidental, and not particularly associated with or dependent upon the one common lesion found must remain doubtful. It was unfortunate that we were unable to obtain a complete post-mortem examination in the pyloric case so that the condition of the heart and lungs might have been ascertained. It is quite fair to assume that some of the most distressing symptoms in both cases were more dependent upon cardiac and pulmonary conditions than upon the bowel lesion; indeed, one might go further and say that the thrombotic condition of the mesenteric vessels was a sequel to, rather than a precursor of, pathological processes taking place elsewhere. That, however, we had symptoms unmistakably pointing to bowel trouble is, I venture to think, sufficient justification for regarding the cases of distinct interest from such a point of view. And, further, knowing as we do that thrombosis is not an uncommon sequel to operation, it is reasonable to bear in mind that, however difficult it may be to explain, even the mesenteric vessels, either in their main trunks or in their radicles, may, in some instances, be the vessels to become primarily involved.

In the reports of cases which have from time to time been given, whether of embolism of the arteries or thrombosis of the veins, there is considerable variation in the symptoms met with. This, doubtless, arises from the different degrees of the lesion found; thus, an embolus plugging the main trunk of the inferior or superior mesenteric artery will produce symptoms of a much acuter and more distinct character than those arising from a plug of only a branch of these vessels. Again, a limited thrombosis of the venous radicles will produce symptoms of a comparatively mild and indefinite character as compared with a plugging of the main venous trunks. In most cases where there has been involvement of main trunks the patients have been past middle life, with atheromatous vessels and with probably cardiac valvular disease. And further, associated with the embolic or thrombotic condition of the mesenteric vessels, there have been found infarctions in other organs of the body.

Post-operative thrombosis in comparatively young patients finds its origin, however, in other causes than those associated with grave pathological lesions of either the heart or blood vessels. Upon the general subject, however, of thrombosis I have no intention to enter. I am merely recording these two cases as special illustrations, I believe, of this particular kind of thrombosis affecting the mesenteric vessels; and to illustrate further a series of symptoms which may be taken as indicative of the onset of such a complication when arising in a patient upon whom some operation has been performed.

Believing that these two cases were instances of thrombosis

of the mesenteric veins, I have looked up the records of such cases as have been published and find that while there is much variation in the severity of the symptoms as they appear at the onset and throughout the course of the disease there are not wanting those which seem to be more or less characteristic. Thus (1) intra-abdominal pain is invariably present, sometimes commencing acutely, at other times gradually and with no more discomfort than is manifested by a sense of uneasiness. In not a few instances the pain has been colicky in character, sometimes located in the region of the umbilicus, at other times low down in the abdomen. (2) The passage of loose stools sometimes containing blood. This symptom is an uncertain one and seems to depend upon the extent of bowel involved, and the degree of its congestion. It is, however, when present an unquestionably valuable diagnostic sign. (3) Vomiting is also a very inconstant symptom and seems in like manner to be dependent upon the degree and extent to which the bowel is thrown out of action by its impaired vascular supply. It is the presence of this symptom which so frequently causes these cases to be taken as instances of acute intestinal obstruction, and which to a certain extent they are, although a wrong cause is usually ascribed to them. (4) The general condition of the abdomen is as a rule negative; there is neither rigidity, tenderness, nor distension although towards the close of the case the latter may become more or less manifest. (5) The pulse, which has sometimes remained more or less normal in power and speed, is in most cases weakened and increased in rapidity. (6) The temperature presents no certain character, although in the severe cases it is usually reduced. (7) A symptom which has been noted in not a few instances, has been great excitability of the nervous system. In my own two cases it was present to a remarkable extent and suggested, as already stated, that the patients were hysterical. It is possible that the symptom has only a very indirect connection with the disease, and is merely an accident, which arises from a constant sense of pain and discomfort acting upon a naturally over-excitable nervous system.

In conclusion, I am disposed to think that the following symptoms when occurring within a few days after an operation may be taken as suggesting post-operative thrombosis of the mesenteric vessels; and more particularly so when the operation was not one involving the intestines:—

1. The onset of intra abdominal pain, gradual or acute, but more or less constant, and possibly of a colicky character.
2. Neither tenderness on palpation of the abdomen, nor distension nor rigidity of the parietes in the earlier stages.
3. Possibly diarrhoea with or without blood.
4. Possibly vomiting, but not of the usually acute obstructive character.
5. Rapidity of pulse.
6. Undue and inexplicable restlessness and excitability.
7. Any pre-existing symptoms of cardiac or vascular disease may be considered to attach additional weight to the significance of the other symptoms.

In searching for references of thrombosis of mesenteric veins I have been unable to find any record of a case following upon, or dependent upon operation. Those given below are limited to such as were of a more or less uncomplicated character, that is to say cases, which manifested very definite symptoms the result of the thrombosis.

Recorded Cases of Thrombosis of the Mesenteric Veins.

Payne, *Path. Soc. Trans. Lond.*, vol. xxi, p. 228. Fagge, *ibid.*, vol. xxvii, p. 124. Taylor, *ibid.*, vol. xxxii, p. 61. McWeeney, *Dubl. Jour. of the Med. Sci.*, 1894, vol. xcvi, p. 169. Delatour, *Annals of Surgery*, 1895, vol. xxi, p. 24. Bradford, *Clin. Soc. Trans. Lond.*, 1898, p. 203. Johnson, *ibid.*, 1898, vol. xxxi, p. 212. Köster, *Deut. med. Woch.*, 1898, p. 329. Ballance, *Lancet*, 1899, vol. ii, p. 85. Welch, *Allbutt's System of Medicine*, 1899, vol. v, p. 218. Johst, *Inaug. Dissert.*, Königsberg, 1894. Johst also gives abstracts of the following recorded cases:—Choquet, *Bull. de la Soc. Anat.*, 1878, s. 124; Pilliet, *Prog. Méd.*, 1890, No. 25; Eisenlohr, *Jahrb. der Hamburger Staats Krankenanstalten*, 1890, ii, 2, p. 76; Dreyfous, *Bull. de la Soc. Anat.*, 1885, p. 274.

A GENERAL meeting of the Medico-Psychological Association of Great Britain and Ireland will be held at 11, Chandos Street, London, W., on Thursday next at 3 p.m., under the presidency of Dr. Oscar Woods, when Sir T. Lauder Brunton will read a paper on Fairies, Apparitions, Visions, and Hallucinations; and Dr. E. D. O'Neill, District Asylum, Limerick, will move a resolution with regard to pensions for Irish asylums officials.

ON THE REMOVAL OF GREAT LENGTHS OF INTESTINE.*

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THE preparation of this paper has arisen out of my having been very kindly entrusted by Mr. Hayes, Senior Surgeon, Mater Misericordiae Hospital, with the publication of a case in which he performed with perfect success a very extensive resection of the small intestine in a boy aged 10. The operation was done for a crush of the intestine with extensive laceration of the mesentery. The notes of the case are briefly as follows:

History and State on Examination.—A boy, P. B., aged 10, was admitted to the Mater Misericordiae Hospital on August 3rd, 1900, with the history that he had been run over by a heavy waggon while in the prone position. The waggon, weighted with a ton and a half of grain, passed across his lumbar region. He was taken up and immediately brought to hospital, where he was found to be suffering from shock; his face was pale, his pulse about 90, and the temperature slightly subnormal. Examination of his abdomen and back showed considerable bruising in the lumbar region and on the front of the left thigh. A small hæmatoma was present on the front of the abdomen about midway between the umbilicus and pubes and over the right Poupart's ligament was an elongated irregular wound about 5 inches long. The abdomen was slightly rigid and tender to the touch. He did not make much complaint of pain. There had been no vomiting. On passing a catheter about three or four ounces of perfectly clear urine came away. There was thus no very clear indication for surgical interference beyond dealing with the wound on his right side and combating the shock which was present. The skin around the wound was cleansed and the edges brought together over a length of gauze. For the shock he was given a hypodermic injection of 4 min. of liq. strychnina and external heat was applied in the form of hot jars. No food was given by the mouth. A careful watch was kept for the further development of symptoms. Strange to say, in view of the grave lesions subsequently found to be present, he passed a fairly good night, sleeping well with some intervals of wakefulness and slight restlessness. In the morning, however, he began to vomit, and the vomiting was repeated two or three times, greenish bile being brought up each time. His condition had now much altered for the worse. He became very restless and complained of much pain and great thirst. His pulse was found to be very rapid, 95 to the half minute. His abdomen was swollen, tense, and tender, especially over the epigastric region, tympanitic to percussion but without loss of hepatic dullness. The temperature was 101.5°. It was evident that a grave abdominal lesion had occurred and laparotomy was at once proceeded with, the provisional diagnosis of ruptured intestine having been made.

Operation.—After the preliminary cleansing of the skin, the patient being under the influence of ether, a median opening was made in the usual situation between umbilicus and pubes. On reaching the abdominal cavity some liquid blood mixed with clots came away and swollen intestine tended to protrude. The distended coil was drawn out and there followed it more blood which was dried up with sponges. On examining now a long transverse rent was discovered in the mesentery about 3 inches from the intestine, cutting off the blood supply of a huge coil of intestine, while above this again was another portion of intestine which was so crushed that its vitality was evidently gone. At this place the intestine was somewhat twisted on itself so that its lumen was interrupted; above this was healthy but distended intestine. No actual perforation was present in any part of the intestine. It was at once determined to remove the whole damaged segment, which was done after tying off and dividing the mesentery which intervened between the rent and that connected with healthy intestine. The upper margin of the rent in the mesentery was not ligatured, hæmorrhage from the vessels having already ceased. Long pressure forceps were then placed on the intestine at the upper and lower limits of the portion to be removed, the latter being about 3 inches from the ileo-cæcal valve. Above and below this the lumen was blocked by lightly tying a piece of rubber tubing passed through a hole in the mesentery about 3 inches away from each clamping forceps. The gut was now cut through close to each forceps, and the segment thus freed removed. The ends were then brought together by a Murphy button, and over the line of union a few Lembert sutures were inserted. No attempt was made to suture the gap in the mesentery, as the patient's condition did not admit of delay. The wound was now closed, about a pint of normal saline solution having been left in the abdomen; the usual antiseptic dressing was applied and the patient sent back to bed. He had borne the operation fairly well considering its extensive character, but for two or three days his condition was such as to cause the gravest anxiety.

Progress.—His pulse-rate continued for some time to fluctuate between 140 and 160, and his face presented an extremely anxious and haggard appearance. His temperature, which on the night of the operation was 100° F., rose to 102° the next morning. The evening after the operation it had fallen to 98°, next morning it was 98° rising to 99.6° on the second evening, since which time it remained normal or within a few points above it. The treatment during the earlier days was as follows, strychnine (m 4 of the liquor) was given hypodermically every sixth hour. On the night of the operation he was given a zymised suppository and this was repeated every fourth hour. In addition nutritive enemata containing a beaten up egg with some brandy and milk was given every night and morning. Nothing was given by the mouth for the first three days, but sips of hot water and a teaspoonful of brandy every hour. On the third day milk diluted with an equal quantity of water was given to him, and panopeptone, a teaspoonful every second hour. This treatment with the

*Read before the Royal Academy of Medicine in Ireland.