painless, and usually easily retained for a sufficient length of time to have a good chance of exerting its disinfectant and astringent properties. The following brief notes will serve to illustrate the effects of albargin in different types of cases.

CASE I.—Acute Bacillary Dysentery Resisting Purgative Treatment, but Cured by Three Albargin Bowel Washes.

An Indian Christian male, aged 38, admitted for suspected cholera, but proved to be a case of acute bacillary dysentery. From eleven to seventeen stools daily, containing much blood and mucus. No improvement after eight days' treatment with castor oil and opium, followed by salines. One pint of albargin of the strength of 1 grain in 1 oz. (approximately 1 in 500 solution), given as an enema, and increased to 1½ pints on each of the following two days. The evening temperature, which had been rising to 99° and a little over, fell to 97°; the blood disappeared at once, and the mucus finally after six days, by which time the stools had become reduced to one or two healthy motions daily, and he was on solid food. He was discharged four days later, and came to see me several times during the next three months, and has remained well. The rapid improvement after the failure of other treatment in a severe case, which was threatening to become chronic, was striking.

CASE II.—Chronic Bacillary Dysentery of Eight Months' Duration Rapidly Cured by Albargin.

European female, aged 17, admitted for chronic dysentery for eight months without intermission. No amoebae found on repeated examination of the stools, which contained blood and mucus and numbered three to four daily, being passed with gripping pains. History of fever at first, but none now. Treated with castor oil emulsion and bismuth salicylate for five days without improvement. Then one and a half pints of one grain to the ounce albargin solution given as an enema on three successive days, and retained for from fifteen to thirty minutes without pain. The blood and mucus disappeared after the second injection, and one healthy stool was passed daily during the following week, although solid diet was given two days after the last bowel wash. No relapse occurred, and she has been seen repeatedly during the two months following her discharge from hospital and has remained in good health. Such a rapid recovery after eight months' suffering is very encouraging.

CASE III.—Severe Bacillary Dysentery in a Young Child Cured by Albargin.

A European child, aged 2½, had been treated for severe dysentery, with up to twenty stools a day, for twelve days with castor oil, emetine, and saline enemata. No material improvement had resulted and the condition of the child was becoming serious. Captain Green-Armistage, I.M.S., now asked me to see the case, and I advised that 8 oz. enemata of albargin of the strength of 1 grain to 1 oz. should be given. Improvement began after the first injection, and shortly after a second, four days later, no further blood or mucus was passed, but a third was given as a precautionary measure. The child rapidly picked up and was discharged cured two weeks after the commencement of the albargin treatment. The absence of pain after the injections in so young a child is of interest, as well as the immediate improvement after the failure of other treatment.

The foregoing cases will suffice to illustrate the value of the new treatment in certain cases of bacillary dysentery, while the following is a brief summary of the results obtained in a consecutive series of all the cases so far treated in my ward. They number twelve, including those already recorded above. Four acute cases of less than two weeks' duration on admission were all rapidly cured by from three to five albargin enemata, although two of them had suffered from other attacks within the previous few months. Of the 8 chronic cases 5 were of from one to four months' duration, 1 of eight months and 2 of sixteen months. Of these 8 cases, one patient left hospital two days after the treatment was begun, so should be excluded. One of sixteen months' duration improved considerably, but the drug failed to cure him, and he is still in hospital. The remaining 6 were cured, from three to five injections being given in 5 of them, while a larger number were required in the sixteen-months' case, who had previously been treated unsuccessfully with nargol enemata. As all these cases had resisted the usual treatment with castor-oil and salines for an average of seven days (mild cases clearing up under purgative treatment not being given bowel washes), these results are distinctly encouraging, and are certainly better than I have previously obtained in similar cases by older methods.

Lastly, it should be mentioned that albargin bowel washes failed to do good in two patients, who were

subsequently found to have pathogenic amoebae in their stools, although on their admission amoebae had not been found, so that the silver gelatose appears to be useless in amoebic cases, although of great value in bacillary dysentery.

I have not yet been able to test the value of the other antiseptics which my experimental investigation show to be worthy of trial in non-amoebic dysentery. The main object of this communication is to draw attention to the principle that medicated enemata are clearly indicated in the treatment of chronic bacillary dysentery, owing to the lesions being usually limited to the lower half of the large intestine, and consequently easily reached by bowel washes.

GASTRIC TETANY IN THE ADULT.

BY

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IN 1869 Kussmaul drew attention to the occurrence of tetany in cases of chronic dilatation of the stomach. Since that date about sixty cases of a similar nature have been recorded in adults. In the majority the dilatation of the stomach was due to the cicatrization of a chronic ulcer in or near the pylorus, but in a few tetany has been observed to follow dilatation of the stomach due to other causes than ulceration. Thus, in a case recorded by Trevelyan, it occurred as a complication in a carcinomatous stricture of the duodenum, and in a case recorded by Fleiner it was associated with a sarcomatous growth of the stomach, one attack being immediately fatal. Also, tetany has ensued from dilatation of the stomach due to twisting of the duodenum, pressure of an enlarged gall bladder, and pressure on the duodenum by a pancreatic cyst. The most prominent feature of this disease is the occurrence of a tonic spasm of the muscles of the upper and lower limbs, but sometimes intermittent spasm of the jaw, neck, and back muscles is present; these attacks last from a few minutes to half an hour, and disappear as suddenly as they came. During their continuance the patient is unable to open the mouth or to swallow, and in several instances opisthotonos was a well-marked symptom.

In other cases the tetany is followed by convulsions that closely resemble epilepsy, the fits are usually repeated in rapid succession. In typical cases the wrists and elbows are partially flexed, and the forearms strongly pronated; the fingers are bent over the thumbs, flexion being most marked at the carpo-phalangeal joints; the palms are hollowed by the approximation of the thenar and hypothenar eminences, and therefore the hand becomes cone-shaped (the accoucheur's hand). In the lower extremities the legs are rigidly extended, the heels drawn up, the soles of the feet turned inwards, and the toes are bent downwards and adducted. The patient often complains of pain while the spasm lasts, and the affected parts are blue and cold. The deep reflexes are much increased, the superficial reflexes may also be exaggerated, and the muscles react very readily to the interrupted current. The patient generally remains quite conscious during an attack. The breathing is quickened, the pulse full and regular. The temperature is at first often depressed, but in fatal cases it often rises to 108° F. before death. The pupils are often contracted, but react both to light and accommodation. Cutaneous sensibility rarely undergoes any decided alteration, but in two or three of the recorded cases transient hyperaesthesia was observed. Retention of urine usually occurs, and the urine often contains a small quantity of albumin. Occasionally a trace of sugar or acetone is present. Delirium, rise of temperature, excess of albumin in the urine, coma with dilatation of the pupils, and the presence of tetanic or epileptiform seizures are all evil signs. In almost every case the first attack is soon followed by several others. The duration of the spasm may be from four or five minutes to several hours, but it may remain almost constant for two or three days. It often follows an attack of vomiting or diarrhoea, and a spasm may sometimes be induced by percussing the epigastrium, by passage of a stomach tube, or by pressure on the main artery of a limb. Sometimes patients have

premonitory symptoms, such as tingling and creeping sensations along the arms and down to the finger-tips, associated with headache and often a feeling of nausea.

Etiology.

The disease was originally attributed by Kussmaul to an excessive loss of fluid from the circulation, produced by the vomiting, but this theory is not now generally accepted. Hyperchlorhydria, which usually accompanies chronic ulcer of the stomach, is thought by some to be the cause, but as tetany has been present in cases of dilatation of the stomach due to cancer and external pressure on the pylorus—conditions not usually accompanied by excessive acidity of the gastric juice—it is improbable that an excess of acid is the cause of these nervous phenomena. The most probable cause is the absorption of some poison produced in the dilated stomach by bacteria. This theory of autointoxication is supported by the fact that gastric lavage gives temporary relief. Also, in cases of tetany associated with dilatation of the large intestine, which is analogous to dilatation of the stomach, irrigation of the bowel causes the tetany to disappear and the accumulation of faeces is followed by its reappearance. Another point in support of this theory is the well-known fact that in cases of poisoning by certain convulsants such as strychnine, a spasm can often be induced by slight forms of peripheral irritation; and it has already been noticed that in these cases of tetany the mere percussion of the skin over the epigastrium was sufficient to induce an attack. The occurrence of albuminuria in connexion with gastric tetany is of interest. Both Blazicek and Hoffman have recorded cases in which the kidneys presented signs of Bright's disease after death, but in others the organs appeared normal to the naked eye. It is very probable, however, as Soltau Fenwick has suggested, that the albuminuria is sometimes the result of congestion of the kidneys consequent upon the failure of the respiration, while in other cases it may probably be due, as Trevelyan has suggested, to the excretion by the kidneys of the poisons absorbed from the stomach.

In a case of gastric tetany on which Halliburton and McKendrick made observations, the vomit contained acetone, hydrochloric, acetic and butyric acids, but no sarcinae. The patient was a man about middle life who had had gastric ulcer when a young man. The stomach was markedly dilated. The urine during the tetanoid seizure contained a trace of albumin and also acetone. After the cessation of the spasm these substances passed away and gave place to a trace of sugar. Fluid was prepared from the gastric contents after the cessation of the tetanoid seizure during the convalescence of the patient. A cat was anaesthetized with A.C.E. mixture, and 5 c.cm. of the solution, equal to 20 c.cm. of the original gastric fluid, injected into the external jugular vein. No spasms or convulsions were produced; whether these would have occurred had not the animal been anaesthetized it is impossible to say. There was considerable slowing of the heart and a large fall of arterial pressure. The pressure slowly recovered its original height, but the heart beat faster than before the injection.

After the blood pressure had regained its original height the vagi were cut, and soon after 5 c.cm. of the tetany fluid were again injected. The response was almost negative. The main fall of blood pressure was therefore due to an action on the cardio-inhibitory centre. The tetany fluid was acid, giving the colour tests for hydrochloric, and, in view of the fact that the acid substance or substances might cause the fall in blood pressure, the original fluid was injected, as before, into the external jugular vein, after neutralization. The injection only produced a slight fall of pressure. After section of the vagi there was a similar slight effect as a result of the injection. In another experiment to ascertain the effects of the injections of free hydrochloric acid of the same strength as that of tetany fluid, the result was an insignificant fall of pressure not abolished by section of the vagi. They therefore concluded from the results of these three experiments that the tetany fluid contained a substance much more poisonous than the hydrochloric acid itself, but which was distinctly acid in reaction. They also injected into animals the gastric contents obtained from patients in health or suffering only from mild dyspepsia. The gastric contents were prepared in the same manner as

that used in the former experiments. The effect was an insignificant fall of arterial pressure whether the vagi were cut or not, and the slight fall was about equal to that produced by dilute hydrochloric acid. They concluded that the only plausible theory was that of autointoxication. It seems to me very probable that the organic poison responsible for these nervous symptoms is frequently present in the stomach of persons affected with pyloric or duodenal obstruction, but that its absorption is prevented by the integrity of the columnar epithelium. When this natural barrier is injured, or partly removed by the employment of a tube, or by a very severe attack of retching, the convulsive agent is enabled to gain immediate access to the circulation and to exercise its toxic effects upon the central nervous system. The thyroid and parathyroids, by the formation of an internal secretion which renders this toxin harmless, are probably very often responsible for protecting cases of gastric toxæmia from tetany. This theory is supported by the fact that tetany frequently follows removal of the thyroid and parathyroids, and also by the frequent association of gastric toxæmia with an enlargement or hyperplastic condition of the thyroid.

The following case, admitted to the London Temperance Hospital under the care of Dr. Soltau Fenwick, is interesting:

A man, aged 58, was admitted with a severe attack of tetany. For six weeks before admission he had suffered from attacks of vomiting every two or three days, accompanied by severe pain. The tetany lasted for six hours after admission, every muscle in his neck, trunk, and limbs being in a state of rigid contraction; his temperature rose to 102.8° F., and he was unconscious. A few days later he had another attack. Dr. Fenwick diagnosed simple pyloric stenosis and suggested gastro-jejunostomy. Mr. Paterson, on opening the abdomen, found the stomach greatly dilated, and a very tight pyloric stricture, caused by the scar of an old ulcer; he therefore performed gastro-enterostomy. The man is now in perfect health and can eat and digest anything. Since leaving the hospital he has almost doubled his weight.

I have been able to collect the records of thirty-nine instances of the disease. Of this number twenty-four were males and fifteen females. The average age at which the disease appeared was 42, the youngest patient being 20, and the eldest 66. In the great majority of the cases the symptoms of gastric disease had existed for many years prior to the onset of the nervous affection, and in only three instances out of the entire number for a period of less than twelve months. Out of nineteen cases in which an accurate account of the *post-mortem* examination is recorded, eleven exhibited a dilated stomach due to the contraction of a chronic ulcer in the pyloric region. In one case the pylorus was greatly contracted from the cicatrization of a chronic ulcer, but there was not much dilatation of the stomach; in two cases the gastric dilatation was dependent upon the cicatrization of an ulcer in the first portion of the duodenum. In one case cancer of the pylorus coexisted with chronic ulcer, but in another case a large growth, evidently cancer, was found at the pylorus. In only two cases was the increase in the size of the stomach found to depend upon simple atony of its walls. From these facts it is therefore evident that in the majority of these cases dilatation of the stomach was a long-standing affection, and owed its origin to the presence of a chronic ulcer in the pyloric region. In the majority of the cases the nervous symptoms consisted of a tonic contraction of the muscles of the hands, forearms, feet, and legs, but in a few, tetanic contraction of the jaw and body muscles were present. In three cases seizures of an epileptiform nature were present.

Treatment.

Out of the 39 cases recorded only 11 recovered, so that it must be admitted that the treatment has been far from satisfactory. Every drug, from calomel to the latest antiseptic, has been tried. Oddo recommended calomel as a purge every other day, and benzonaphthol in $\frac{1}{2}$ grain doses every two hours as an intestinal antiseptic. Boas recommended the use of diuretics. Gibb used in the treatment of his cases hypodermic injections of morphine and atropine; internally he gave liquor arsenicalis, liquor hydrargyri perchloridi, and sodium salicylate; he also gave a purgative consisting of calomel, podophyllin, and extract of belladonna with magnesium sulphate first thing in the morning. Pratt, in the treatment of his case, washed out the stomach with 2½ pints of lotio acidi borici,

and injected morphine hypodermically. Oxygen was also administered, and ether injected hypodermically. Gordon administered 30 grains of potassium bromide and 15 grains of chloral hydrate, but as this had no effect he then gave chloroform, which gave relief for a short time. Numerous authorities recommend gastric lavage, but this is a rather dangerous procedure, as passing the stomach tube, even a soft one, very often induces a severe attack of tetany. Others have advised the patient to take a large quantity of water, followed by an emetic, but I cannot find any case recorded in which this treatment has been successful. The only treatment up to the present that has given hopeful results is operation, but even this has not always prevented a recurrence of this grave disorder, as quite a number of cases have had attacks of tetany during the week following the operation. Rectal feeding for a week before the operation would, in my opinion, overcome this difficulty. The patient should have a dose of calomel and then a saline purgative every morning. Fifteen ounces of peptonized milk should be given by the rectum every six hours, and the bowel should be kept well cleansed by giving a saline or soap enema once every twelve or twenty-four hours, and about an hour before the rectal feed. Oral sepsis must be avoided by daily washing the mouth and cleansing the teeth and gums, and in order to prevent parotitis, at one time a serious complication in cases where rectal feeding has been necessary and food by the mouth had been prohibited, the patient should have a rubber teat to suck. By the above method the attacks become less frequent and less severe, and tend to disappear usually about the third or fourth day of treatment.

A CASE OF ACUTE DILATATION OF THE STOMACH OCCURRING IN THE COURSE OF AN OPERATION FOR DUODENAL ULCER.

By W. G. RICHARDSON, F.R.C.S.,

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A. M., a miner, aged 47, for many years had symptoms pointing to the existence of a duodenal ulcer. At 9 p.m. on October 5th, 1913, the ulcer perforated whilst he was walking, some 200 yards away from his house, and he had difficulty in getting home. He did not vomit. He was sent to the Royal Infirmary, where I saw him at 4 a.m. on October 6th, that is, seven hours after the sudden attack.

There was no difficulty or doubt about the diagnosis, but three features of the case were noted as unusual.

1. The abdomen had not the extreme board-like rigidity generally present in such cases; indeed, for a case of ruptured ulcer, the abdomen was rather lax.

2. There was abdominal respiration and very little movement of the chest—in contrast to the usual fixity of the abdomen in such cases of recent peritonitis.

3. The pupils were widely dilated.

A hypodermic injection of morphine $\frac{1}{2}$ grain and atropine $\frac{1}{16}$ grain was given, and the patient operated upon without delay.

The abdomen was opened by a vertical incision through the middle of the right rectus muscle extending from the costal margin to a point an inch below the umbilicus. The diagnosis was confirmed, a chronic duodenal ulcer, with a perforation at its centre like the punch-hole in a tram ticket, being found about half an inch from the pylorus. There was lymph on all the adjacent peritoneum, but not a great quantity of extravasated fluid. The stomach was empty and small. The hole in the duodenum was closed with a catgut purse-string suture reinforced by a row of silk sutures.

The operation was simple and easy in every way but one. There was no occasion to use retractors to overcome rigidity of the abdominal wall, and gastro-enterostomy was not necessary. The only trouble arose from the difficulty in administering the anaesthetic satisfactorily. Anaesthesia was induced with chloroform (he appeared to be an alcoholic man, and he struggled a good deal), and it was kept up with ether, given by the open method, throughout the operation. The patient was all the time

a bad colour and the respiration was entirely abdominal, the chest movements being scarcely perceptible. Fortunately the patient was not stout, there was no distension of the abdomen, and there was very little muscular rigidity. I was therefore able to complete the operation in spite of the excessive abdominal movement. The pupils continued to be widely dilated. I sutured the abdominal wall with a first layer of continuous catgut, and had sewn up about two-thirds of the peritoneal wound when I noticed that the upper part of the abdomen was distending. In less than half a minute the stomach was bulging into the lower part of the wound and the distension increased so rapidly that the suture had to be unlaced. The stomach dilated more and more until it became drum-like and very tense. It appeared to be anchored at the pylorus and the cardiac extremities, because, as the distension increased, it rolled upwards, bringing the greater curvature forwards. The veins on the stomach became very prominent and enlarged. I did not see any distension of the duodenum, and the lower part of the abdomen did not increase in size. A stomach tube was passed by the mouth, and immediately there was a rush of gas through the tube, and the distension disappeared. The stomach then became firmly contracted and not greater in diameter than a piece of large intestine. The muscular contraction was extreme and there was no peristaltic wave. It contracted in sections, there being alternating white rings and intervening portions more naturally coloured. The venous engorgement of the stomach also disappeared entirely. At the same time the respiration became quiet and wholly thoracic, the complexion became pink, the pupils contracted, and the whole aspect of the patient changed. Less than five minutes elapsed between the beginning of the distension and recovery. The patient did well, and has not differed in his after-progress from other cases of ruptured duodenal ulcer.

The points which impressed me were:

- (a) Before the operation: (1) The abdominal respiration. (2) The dilated pupils.

- (b) During the operation: (1) The continuance of the dilatation of the pupils. (2) The increase of the abdominal respiration.

- (c) After the acute dilatation set in: (1) The rapidity of the distension. (2) The extreme venous engorgement of the stomach. (3) The quickness of the recovery. (4) The simultaneous disappearance of the abdominal respiratory movement, of the dilatation of the pupils, and of the engorgement of the veins.

Acute dilatation is the expression used when we speak of these cases, but acute distension would, perhaps, convey a more accurate impression of what takes place. It was obvious that there was great internal pressure, because the stomach was smooth on the surface and extremely hard, and the gas was forcibly ejected through the oesophageal tube. The manufacture of the gas took place in the stomach only, and the distension was as rapid as could have been produced by means of gas injected by a Higginson's syringe. The size of the veins indicated a very vascular mucous membrane and suggested increased secretion. The association of respiratory and vasomotor irregularity would point to an affection of the medullary nerve centres as being a possible cause.

UNDER the will of the late Mrs. Anne Sutton of Derby the Derbyshire Royal Infirmary and the Derbyshire Hospital for Sick Children receive bequests to the value of £3,000 and £500 respectively.

THE Roman Anthropological Society has decided to form an Italian Committee for the study of eugenics. The president is Professor Giuseppe Sergi and the members of the committee are Professors Corrado Gini, Giovanni Mingazzini, and Alfredo Niceforo; the secretary is Dr. Umberto Saffioti. The committee will study the factors that may determine the progress or decadence of races, in the physical as well as the physical aspect. To that end it will carry out researches on the normal or pathological inheritance of characteristics, on the influence of the environment and mode of life of the parents or their offspring, on the importance of the conditions of the organism during the act of reproduction, and on the influence of the mode of life or of the environment on the development of the new organism. The office of the Committee is in the premises of the Società Romana di Antropologia, Via del Collegio Romano, 26, Rome.