(II) the total free acids plus acid salts from (III) the total acidity, we obtain the total combined acids (the total combined HCl in cases where free HCl is present) (V). By adding this total combined HCl (V) to the total free HCl (I) we obtain the secreted hydrochloric acid (VI).⁶

This analysis can be accomplished in five to ten minutes. It necessitates for apparatus a burette, an evaporating dish, a lamp, a test tube and a glass rod. The necessary reagents are (1) A decinormal soda solution; (2) one-half-per-cent. alcoholic solution of dimethyl-amido-azo-benzol; (3) Congo-red paper—filter paper soaked in a five-per-cent. aqueous solution of Congo red; (3) a one-per-cent. alcoholic solution of phenolphthalein; (4) a saturated alcoholic solution of 00 tropeolin. The estimations should be made twice, and the records of the tests with the second mixture of contents taken as final. For this estimation is made with an approximate idea of the results to be obtained already in mind, so that there is less waste of material in the process. The simplicity of the method admits of the employment of this quantitative analysis of the gastric contents as a routine method of diagnosis in private practice and in out-patient hospital work without undue sacrifice of time or labor.

In cases in which free hydrochloric acid is present to the Töpfer test, this analysis includes, with the exception of the qualitative test for lactic acid,⁷ all the tests which are necessary in ordinary clinical work. Where the Töpfer test is absent or doubtful the qualitative test for free HCl must be tried with 00 tropeolin, Boas resorcin reagent and phloroglucin vanillin. Where a trace is discovered by one of these tests which could not be determined by the Töpfer test, the amount present is recorded as a trace, it being too small to admit of a definite quantitative determination.

Methods of analysis in cases with no free HCl; qualitative test for combined HCl.—In cases in which no free hydrochloric acid is present by any of the qualitative tests the contents are first tested with Congo-red paper. A positive test shows the presence of free acids (in this case organic acid) or of acid salts or of both. Five cubic centimetres of the contents is then estimated with the soda solution against Congo red (II) and phenolphthalein (III) in turn, and the total free acids plus acid salts and the total acidity determined.

If no free acids plus salts are present the contents are first tested with blue litmus. If the test is positive the presence of combined acid of some kind, either mineral or organic, is proven. Five cubic centimetres of the contents is then estimated against phenolphthalein to determine the total acidity (III).

In cases in which no free hydrochloride acid is present and the contents are still acid, it is of much importance to determine whether or not the combined acid present or a part of it is combined hydrochloric acid. For by this determination we ascertain whether or not

⁶ This total hydrochloric-acid record is the index of the secretory force of the stomach, much more accurate than the record of total acidity or total free HCl.

⁷ To test for lactic acid two cubic centimetres of the filtered contents is added to five of a colorless solution of ferric chloride. If this test is negative lactic acid is absent. If the test is positive (if a lemon-yellow color appears in the ferric-chloride solution) the test must be confirmed by performing this ferric-chloride test with an ethereal extract of the contents. If this test is positive, lactic acid is present. If it is negative, the color in the preliminary test was due to some substance other than lactic acid.

any hydrochloric acid is secreted; that is, whether the acid-secreting cells of the stomach suffer from a total loss of function or a simple diminution of this function below normal. This fact may be ascertained in a simple manner by subjecting the contents to the qualitative test for chlorine, except that present in the form of inorganic chlorides, known as the Ewald-Sjoqvist test.

VII. *Test for combined hydrochloric acid in the absence of free hydrochloric acid.*—Ten cubic centimetres of the contents is mixed with a pinch (half a saltspoonful) of barium carbonate. This mixture is evaporated and the residue fused to a red heat in a platinum crucible (fused to a red heat only). The fused mixture is treated with boiling water. The mixture is filtered. The filtrate and wash-water together should amount to about 30 cubic centimetres. To this filtrate (cooled) from five to ten cubic centimetres of a saturated solution of sodium carbonate is added. If chlorine in the form of organic chlorine compounds (acid albumins, peptones) is present in the original mixture a white precipitate will form in this filtrate.

When this barium carbonate test is positive, then we know that some of our combined acid is combined hydrochloric acid and that the disturbance of the secretion of acid present is due to a diminution rather than a total loss of function of the secreting cells. This is a fact of considerable importance in our knowledge of the case. This Ewald-Sjoqvist test is very simple. It occupies about half an hour. It necessitates for apparatus a platinum crucible and a Bunsen lamp. The necessary reagents are, (1) barium carbonate CP; (2) saturated aqueous solution of sodium carbonate. All methods of quantitative estimation of the total combined hydrochloric acid in the absence of free hydrochloric acid, which are of sufficient accuracy to be of use, are too difficult of application for use in ordinary clinical work.

I have employed the above plan of analysis as a routine method in all cases of gastric affections in my out-patient clinics for two years. The results from the point of view of diagnosis and of therapeutics and of acquiring a more thorough understanding of the disorders of the stomach have amply repaid the labor.

Clinical Department.

THREE UNUSUAL CASES OF ANGIONEUROTIC EDEMA IN INFANCY.¹

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ALTHOUGH angioneurotic edema is occasionally met with in infancy it certainly cannot be regarded as of common occurrence. The usual seats are the lips and cheeks or the external genitals. The extremities are seldom involved. The location of the swelling and the apparent cause in two make the following cases of unusual interest:

CASE I. Constance M., twenty-three months, woke up on the morning of March 9, 1898, with her left arm moderately swollen. It was not painful and she

¹ Read before the Suffolk District Medical Society, Section for Clinical Medicine, Pathology and Hygiene, October 18, 1899.

used the arm freely. There had been no known injury or exposure. The swelling of the forearm increased during the day and the next morning the hand was also much swollen. She was otherwise perfectly well.

I first saw her at this time. The left forearm and hand were much swollen from the elbow to the second phalanges. The surface was somewhat reddish and a trifle hot. There was moderate pitting on pressure. There was no tenderness and she used the hand and arm freely. There was no lesion of the surface and no enlargement of the axillary glands. The pulse was normal. The arm was bandaged loosely, and on March 12th, four days from the onset, the swelling had entirely disappeared. There has been no recurrence.

CASE II. Ruth B. was seven months old November 5, 1897. One morning, about this time, her mother came in from a walk and gave her her morning bath. Being in a hurry she tested the temperature of the water with her hand. It was later found to have been much colder than usual. The child cried vigorously and when taken out was shivering and blue. She soon warmed up again, but about an hour later it was noted that both her forearms and hands were swollen, bluish and cold.

I saw her soon after. As stated above, both forearms and hands were much swollen and slightly cyanotic. The skin was shiny and there was no pitting. The surface was rather cool. There was no tenderness or pain and the arms were moved freely. There was no enlargement of the axillary glands and the radial pulse was normal. The heart and urine were both normal.

The swelling disappeared, without treatment, in two days. A few weeks later, however, it recurred, evidently as the result of sleeping in a cold room with the arms exposed. At this time it lasted about two weeks, disappearing gradually. All the rest of the winter and spring, until the return of warm weather, the swelling recurred on any exposure to cold. It rarely lasted more than a few hours or a day or two at a time, however. Thick mittens, worn out of doors and at night, decidedly diminished the frequency and severity of the attacks. There was no return of the swelling during the winter of 1898-99. In October, 1899, however, she came in rather late on a cool afternoon, not having worn mittens as the weather was warm when she went out, with her right hand and arm swollen as before. It went away in a few hours and has not returned since.

CASE III. Laura M. was brought to the Medical Out-patient Department of the Infants' Hospital, March 15, 1899. She was then four months old. She was born at full term, head presentation, about three-quarters of an hour before the arrival of the doctor. Any injury to the arms at birth would thus seem improbable. Since birth the right upper extremity has frequently become swollen and purplish. During these attacks the child has seemed unable to use the arm. After from two to six hours the natural appearance and function have returned. The attacks have recurred at any time of day or night and have apparently not been accompanied by pain. The mother was inclined to attribute them to a slight injury to her right arm which she received when she was about three months pregnant!!!

She was a large, fat baby in very good condition. The right arm was then of normal color but the stu-

dent who took the history stated that while he was taking it the arm was markedly purple. It was warm and did not pit on pressure. The circumference of the right forearm was one and one-half centimetre and that of the right arm one-half centimetres greater than that of the corresponding part on the left. There were no enlarged glands in the axilla and the pulse at the wrist was normal. The heart was normal. There was no tenderness and the child moved the arm freely.

She was seen again October 4, 1899. Her aunt stated that the attacks had continued, but had been much less marked during the warm weather. She thought that there was some connection between their occurrence and the external temperature. The swelling had been much more pronounced during the last few days of cool weather. She thought that the right arm was now always a little larger than the left.

The color of the arm was then normal but it seemed somewhat larger than the left and the forearm and hand looked edematous. There was no pitting on pressure, however. The circumference of the forearm was one and a half centimetres and that of the arm one centimetre larger than on the other side. The surface temperature was normal, there was no tenderness and the arm was moved freely. There was no enlargement of the axillary glands, the pulse was normal at the wrist and the heart was normal.

Reports of Societies.

BOSTON SOCIETY FOR MEDICAL IMPROVEMENT.

A. K. STONE, M.D., SECRETARY.

REGULAR meeting, Monday, November 6, 1899, Dr. R. H. FITZ in the chair.

ANATOMICAL SPECIMENS.

DR. BEACH: This photograph is from a child seven years old who was the subject of imperforate anus. The rectum ends within the vulva. The vagina is immediately above it and the meatus of the bladder immediately above that. This photograph has been taken to show the three passages, making a cloacal aperture of the vulva. She was referred to me with the idea that some surgical measure might be advisable, but the control of fecal movements was so good and there being no certainty of a sphincter to guard a new anus, I advised against interference. The child had no inconvenience from the unusual condition, which was discovered by the nurse at birth.

Dr. Beach stated in answer to a question by Dr. Vickery that the conformation of the parts was similar to what exists in the hen.

DR. WITHINGTON: Would Dr. Beach take that position as a rule with regard to all such cases, or was there in this particular case some reason why operative interference was not called for?

DR. BEACH: It was the first time I ever saw this arrangement of the parts. As the child had lived to be seven years old, had not suffered, and there was control of the movements, I felt that in this case we had better make no interference. I have operated a number of times in cases of imperforate anus and once advised a laparotomy soon after birth, where there