extracted, are all questions of great moment, and which necessarily involve special training. Commercialism might, at any moment, by some failure or accident throw discredit on the new treatment, were I to explain fully before advancing my researches to a point where a larger number of improved cases and greater benefits, can be shown the details of procedure in the production of the agent. As yet only a small quantity of serum is on hand—not enough to offer to the profession, having under treatment some thirty cases whom I have promised and wish to inject for some time to come. The production of the serum is costly, and above all it takes months to get the best material. I have reason to believe, however, that it will be possible to shorten the time that has been found necessary to strongly immunize the horses now in use.

THE EARLY DIAGNOSIS OF CARCINOMA OF THE STOMACH, WITH THE BACTERIOLOGY OF THE STOMACH CONTENTS.

BY FENTON B. TURCK, M.D.

PROFESSOR OF DISEASES OF THE STOMACH AND INTESTINES, POST-GRADUATE MEDICAL SCHOOL; ATTENDING PHYSICIAN TO THE COOK COUNTY HOSPITAL, CHICAGO.

(Continued from page 319.)

After the study of sixteen cases Rosenheim (*Berl. Klin. Woch.*, Dec. 24, 1888) concluded that the chemic insufficiency of the stomach in carcinoma ventriculi is not due to the cancer itself, but to the attending atrophy. He divided the pathologic changes into three stages: inflammatory, interstitial and atrophic; adding that these stages may be present at the same time; and Ewald (*Berl. Klin. Woch.*, Dec. 3, 1888) holds that the disappearance of HCl is not due to carcinoma directly, but is merely a disturbance of the functions of the secretory glands.

The post-mortem changes often veil the pathologic changes, unless well marked and permanent lesions occur. It is best, if possible, to secure specimens during an operation for carcinoma of the stomach as far remote from the tumor as possible. In three operations I secured several sections—one for carcinoma planum (anterior wall) where a large area was removed, leaving a border of tissue not infiltrated by cells from the carcinoma; the other two were carcinoma of the pylorus. The sections were cut with a Valentine knife in the fresh state and placed on a slide; 50 per cent. solution of glycerin with a little oil of cloves prevents the change.

A solution after stain in 50 per cent. glycerin is used, for staining, and "irrigated" through according to the old method of Beale. (For making permanent mounts Price's pure glycerin is carried under the cover glass and ringed with cement.) There appears the pathologic changes of inflammation. No distinction between parietal cells and chief cells; cells loosened from their membrane; karyokinesis were illustrated; nucleus crowded to one side; gland cells swollen, closing the lumen; nucleus forced to one side; cells of the mouth and neck crowded together as in proliferation, and lying within the lumen; at other points cystic degeneration, mucoid metamorphosis of pathogenic cells, as shown by Ewald and Boas; leucocytes fill up about the neck and through to the surface of the gland; other points show marked interstitial changes; multiplication of

round cells; vessels engorged flush up to the surface of the mucous membrane, where a rich anastomosis occurs at the mouth and neck of glands. If it is not alone the product formed in the growth of carcinoma of the stomach that causes this inflammatory and rapid destructive process through the infection from growing pathologic and so-called non-pathologic microorganisms colonizing upon the surface of the mucous membrane offers a possible explanation of these changes. Within the lumen of the stomach all forms of germs find their way.

The master work of Miller ("Microorganisms of the Human Mouth," 1890,) has proved that the mouth may become an ideal incubator for at least twenty-five varieties. The nose and pharynx may become an excellent bed for colonization upon the walls. Food and water are by no means aseptic—if we prepare the stomach walls so that colonization may also exist, we have a process set up in proportion to the character of the colonies found—the culture bed and conditions present. In the healthy state the stomach does not seem to encourage colonization in the bed of mucus upon its walls, although germs find their way into its lumen. This will be brought out in another work in relation to gastritis. The predisposing cause seems to be the growing carcinoma—lessening resistance and furnishing a soil,—the inflammatory process, the result of the toxins of the colonizing microorganisms. Well-known pathologic germs produce their special toxins and even the lactic acid bacillus, as shown by Wurtz and Lindet (*La Semaine Med.* Paris, Sept. 9, 1892) produce in animals marked symptoms of diarrhea, distension of the abdomen and extremely rapid emaciation. They learned that cultures in bouillon are very active—toxin is formed having the same effect as the culture itself.

Through the kindness of Dr. Ryan, Louis S., age 40, Italian, was referred to my clinic November 27, complaining of "pain in his stomach and back." No specific history. Family history negative. Experienced no difficulty until within nine months, when there appeared a distress after eating. Appetite remained good; insomnia at times and dyspnea at night. No vomiting. Alternating constipation and diarrhea.

Examination: Skin dry; some evidence of emaciation; mouth, gums inflamed at borders; tongue, light yellowish coat; nose and throat showed no marked lesions; chest organs intact; abdomen, muscles well developed; liver and splenic area normal; stomach, percussion shows slight distension; half moon space of Traube slightly increased; prevailing sound in stomach demonstrated the great curvature one and one-half inches above the umbilicus; no palpable tumor; colon dilated; tympanitis controlled with water and air gave the same results; rectum negative; genito-urinary organs negative.

Analysis of stomach contents two hours after ordinary meal: HCl+; total acidity, 40; Uffelmann's +; blood count 4,800,000. November 27, hemoglobin, 70; fasting stomach twelve hours after meal; reaction neutral. No remnants of previous meal; no stagnation.

Bacteriologic: Six slides stained for microorganisms, after removing mucus from them and mucous membrane with gyromele, four fresh slides unstained. A fine network of long rods appearing like mycelia but more angular. Short rods; colonies in groups attached, end to end and in pairs; streptococci in twisted chains; groups of micrococci; a few yeast germs but no *socius ventriculi* appeared in the field.

Bacteriologic cultures: Stroke culture on sterilized mucous membrane of the stomach of a pig; first stroke line colonies run together; second stroke more separated, especially at side of furrow of the line; pink colonies; grayish colonies spreading; yellow colonies; brown and a few black colonies raised;

as many as ten or twelve different colonies present. On separating out into tubes the short rods seemed more curved and the threads appeared changed. The long slender rods that formed a thick network and a luxuriant growth on the mucous membrane died out in the tubes. The pyogenic germs appeared, as well as bacilli coli communi. Five colonies were lactic acid forming bacilli.

Tube cultures taken direct from the stomach wall: Tube No. 1, left in stomach juice; No. 2, milk (sterilized); No. 3, bouillon made from stomach of pigs; No. 4, same as No. 3 with starch added; No. 5, plain bouillon; No. 6, same as No. 5, starch added. All placed in incubator at 36 C. for twenty hours.

Reaction: All acid reaction except bouillon culture No. 5. Nos. 2 and 4 showed lactic acid. No. 4 was especially marked. The fluid was filtered and extracted with ether evaporated which gave a fair iodoform emulsion. No quantitative estimation made. December 6, ordered meal soup according to Boas method. December 7, withdrew and analyzed. Lactic acid, 85 per cent.

December 15, entered hospital of the Post-Graduate Medical School; oatmeal soup of Boas at night. December 16, withdrew stomach contents. Analyzed by Dr. Wisner showed lactic acid, 75 per cent. Operation ordered; stomach washed out and December 17 I performed laparotomy, assisted by Dr. Beck, and found a scirrhus carcinoma, two nodules at pylorus; one anterior and one posterior tumor, extending from the end of the lesser curvature. Gastro-enterostomy with Murphy button. Patient was attacked with violent hiccough and vomiting; stomach cleaned and fed per rectum; temperature remained normal. December 24, patient died. Post-mortem refused.

July 10, 1894, Mr. F. K., age 53, German, was referred to my office as a stomach case. Complained of pain over xiphoid appendix through to the back. Began to vomit about a year before; had to live on liquid food; dysphagia. Examination: Emaciated; could not pass stomach tube, attempted to pass the revolving sponge but met resistance at the cardiac opening; by using smaller sponges tried to explore the stricture. The cable and spiral within the sponge being more flexible than the ordinary sound there was less fear of puncture. Found a diverticulum containing remnants of undigested food; sputa negative; no albumen or sugar in urine but indican increased. Diagnosis: Carcinoma of the cardiac.

On July 23 gastrostomy was performed by Dr. Newman and myself. Introduced the gyromele through the stomach opening dilated, and passed a rubber tube through the stricture to the mouth. Examination of stomach contents, reaction neutral. July 24, made slides but no cultures were carried out. Slides showed many varieties of long and short rods, especially spirilla. After a gruel injection a slight Uffelman reaction, but not marked. July 28, patient died. No post-mortem allowed.

August 22, 1894, Mrs. S. G. S., widow, aged 65, referred, complaining of distress and burning sensation in stomach after eating. I was told that if carcinoma was thought to be present an operation would be allowed. It is often more difficult to exclude than include. The history, symptoms and general appearance favored carcinoma. Within one year loss of appetite and weight, progressive anemia, morning headache, constipation, belching after eating. Physical examination: Hair dry and brittle; skin dry; panniculus adiposus absent; color, pale, ashy hue. Teeth in good repair; tongue silver gray coat; depression of teeth. Nose and throat atrophic; rhino-pharyngitis; slight discharge from the vault. Lungs negative. Heart, faint mitral murmur. Liver palpable below costal arch. Abdomen retracted. Stomach gastropnoxis; transverse colon upper border below umbilical line; prolapse of right kidney, second degree.

August 23, withdrew contents after Ewald's test meal. Litmus +; no HCl; Uffelman's +; peptone weak; urine contained no albumen, blood or sugar 4,560,000; hemoglobin 55. August 28, four hours after meal, stomach was empty; weak acid reaction. August 30, after Boas' test meal, Uffelman's reaction very weak. No iodoform, showing practically no lactic acid. September 1, bacteriologic: Removal by the revolving sponge of mucus thick and tenacious. Slides show the mucus contains cells of the glands, columnar, round cells, leucocytes, also flat cells, a large number of colonies of rods and micrococci. Tube cultures showed many gas forming germs to be present.

A diagnosis made of gastritis chronica, with beginning atrophy and the complications named. Patient put under a vigorous treatment. Stomach walls cleaned with liquid soap, using the gyromele; oil of cloves and cinnamon ap-

plied. HCl exhibited in large repeated doses, as recommended by Ewald. A selected diet ordered, baths and massage.

September 9, recorded that the headache disappeared, the distress in stomach lessened, with but little belching of gas. September 18 recorded appetite much improved. October 29, disappearance of all symptoms. November 24, patient discharged, but requested to report in one month.

Examination of stomach contents after test meal showed HCl + weak; total acidity 35, Uffelman's; general condition improves; gain in weight and strength; no return of symptoms. December, patient considers herself cured, which can not be. No evidences of carcinoma.

(To be continued.)

THE MEDICAL CORPS OF THE U. S. NAVY.

BY FREDERICK HORNER, M.D.

UNITED STATES NAVY.

In connection with the early history of the American Navy as developed into a distinct arm of the national defense, it is interesting to recall the fact that its embryonic origin was first developed in Virginia under royal authority. As early as 1775 the convention of the colonists of Virginia had directed the Committee of Safety to procure armed vessels for the defense of the colony, and the control and management were intrusted to this committee. Accordingly in May, 1776, the House of Burgesses of Virginia foreseeing the coming struggle with the mother country for the independence of the colonies, and recognizing that the vessels of the merchant marine of James River and border harbors of Chesapeake Bay constituted the elements, if armed and equipped, of a squadron already manned by sturdy sailors who had knowledge of the sea, and commanded by officers of the pluck and experience which have ever characterized the captains of the Marine Service, appointed a Board of Naval Commissioners consisting of Thomas Whiting, John Hutchins, Champion Travis, Thomas Newton and George Webb, who met first in Williamsburg, then the capital of Virginia. These men adopted a plan for the creation of a naval force of seventy vessels which had been employed for purposes of commerce, having been constructed at the Chickahominy Navy Yard, near Norfolk, Va. Among the naval surgeons commissioned for this service during the Revolution were Dr. Balfour, an eminent physician of Norfolk, Va.; Kemp, Lyon, McClurg, Brockenborough, Christie, Reynolds, Sharpless, Pell and others. It was after this period that the seamen and naval forces of the New England States were organized for the national defense. At this period the merchant marine were not usually provided with a surgeon, and physicians who were competent to practice were obliged to go abroad to the universities of Edinburgh or Cambridge to obtain a diploma. In 1764 when the first medical college in America was founded in Philadelphia, now the University of Pennsylvania, and afterwards in 1825 when the University of Virginia had established a medical department, in 1827 the supply of surgeons for the naval service was equal to the requirement, though it may be added in the early days of the colonial period, "physick was not regarded as a fit profession for a gentleman of Southern birth, who, haply was possessed of ample fortune, and had no need to practice a profession."

Among the surgeons commissioned first were W. A. W. Spottswood, Cornick, Harris, Chase, G. R. B. Horner, Brownlee, Whelan Maxwell, Temstell, Squibb, Elisha Kane and others. Surgeon-General