bundles. The latter become granular and indistinct and their affinity for orcein is lessened. New blood-vessels form, the walls of which are friable and are apt to rupture at the base of the vegetations, leading to minute hemorrhages. The characteristic feature of the second period of the second phase is the appearance of vegetations. According to Ziegler, the primary process in their formation is the deposit of fibrin on the valves. According to Achalme, the first change is an alteration in the tissue of the valve, consisting in a dissociation of the superficial elastic tissue and the formation of a prominence on which fibrin is subsequently deposited. The next step consists in a proliferation of the endothelium of the blood-vessels leading to a narrowing of the lumen. Proliferation of the cells then ceases and cicatrization begins, and brings about the well-known results: stenosis and insufficiency of the valvular orifice. As the earliest changes in the valve do not produce a murmur, we may infer that endocardial lesions are more common than is clinically demonstrable. It is probable that the muffling of the heart-sounds noticed so often is due to edema of the heart-valves, and indicates the earliest organic changes.

As to the cause of the endocarditis and of the inflammation of other serous surfaces, as the pleura, the pericardium, and possibly the peritoneum, it is probably the same as that giving rise to the joint inflammation, but it is conceivable that under the damaging influence of the toxins of the rheumatic germ the heart-valves become prepared for the reception and activity of the common micro-organisms of mixed infection—the streptococci, staphylococci, and pneumococci. This would be in keeping with what we know of other diseases, such as typhoid fever and diphtheria, in which endocarditis may be due to specific organism of the disease, but is more often caused by secondary infection, the toxins bathing the valves having facilitated the invasion of pyogenic bacteria.

Rheumatic Pneumonia.—This has been described, but I have never seen an instance. Lebert⁵⁴ found only 2 in 140 cases, although Valliard⁵² makes the proportion very much greater; Stoll¹¹ gives the percentage as 1.1.

Nephritis occurs occasionally, but presents nothing characteristic. I have already referred to the occurrence of *phlebitis*, to which attention has recently been drawn by Censier.¹⁴

Cerebral Rheumatism.—The pathology of so-called cerebral rheumatism is unknown. In a case reported by Soques,⁵⁴ in which there was also hyperpyrexia, the blood and cerebrospinal fluid at autopsy were sterile, and injection of the latter fluid into animals was without effect. Souques believes that the cerebral localization of the disease is favored by a neuropathic taint.

Changes have been described in the spinal-cord—rheumatic myelitis—but the cases hitherto reported are in no way convincing.

CONCLUSIONS.

The following conclusions, based on what has been said before, seem to me to be warranted:

1. Acute articular rheumatism is a specific infectious disease.
2. It is not an attenuated form of pyemia in the sense that it is due to pyogenic organisms of reduced virulence.
3. Its true cause has not been definitely discovered, although the bacillus of Achalme may prove to be the long-sought micro-organism.
4. A number of joint affections resemble acute articular rheumatism, just as certain pseudomembranous in-

flamations of the throat resemble diphtheria, and various diseases of the lung resemble typical lobar pneumonia.

5. These joint diseases should, wherever possible, be separated as *rheumatoid* or pyemic affections.

6. They are best designated according to their cause, as streptococci, staphylococci, gonococci, or pneumococcal arthritis.

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COLOSTOMY FOR PERMANENT FECAL FISTULA.*

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The operation I desire to demonstrate deals entirely with those inoperable lesions which cause occlusion of the rectum or lower portion of the sigmoid flexure of the colon. Its chief feature is the formation of a very considerable loop of that portion of the colon which is immediately above the artificial anus, making what might be called an artificial sigmoid flexure or store-

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house capable of holding a large amount of fecal matter, which may be discharged at long intervals, thus preventing the frequent soiling of the dressings, which are so common in the ordinary operations for fecal fistula.

After making the incision through the abdominal wall, in the left inguinal region, the large intestine is drawn through the wound and strong traction made on the lower portion so that all of the bowel between the rectum and the wound is put well on the stretch. About 4 inches of each leg of the loop should be brought out, thus exposing about 8 inches of colon through the abdominal wound. In uniting the contiguous portions of the loop I employ the method of suturing devised by my friend and former assistant, Prof. J. A. Bodine, making two parallel rows of running silk sutures 4 inches in extent and about one inch apart, one row being on either side of the mesocolon. This structure containing the vessels is caught between the two lines of sutures and adds greatly to the strength of a permanent spur. As soon as the two rows of sutures are completed, the loop is dropped back until only about one inch of the knuckle remains through the wound of incision. This should be held steadily in place by means of silk sutures passed beneath the bowel, that is, through the mesocolon just where it joins the bowel, or the glass rod may be employed to support the loop until adhesions are secured. The margin of the peri-

itoneum lining the abdominal wall in the entire circumference of the wound of incision, is now carefully stitched to the intestine by the usual method. It is my practice to carry the needle well into the muscular tissue of the bowel wall—taking care not to enter the cavity—in order to get a firm hold of the bowel. Every third suture is made to include with the edge of the abdominal peritoneum the muscle and skin, in order to secure such a strong support that the bowel can not tear loose and drop back into the wound. This precaution should be taken even when the glass rod is used. When the condition of the patient will allow, it is safer to wait twenty-four to forty-eight hours before incising the bowel, for by this time the adhesions will have shut off most securely the peritoneal cavity. This can be done under cocaine anesthesia, and consists in shaving off the projecting knuckle about one-half inch above the level of the skin. The fecal contents are discharged through the upper aperture of the bowel, and in the course of time the lower opening becomes contracted, and is used only for the purpose of irrigating the lower bowel, if this should be deemed necessary.

In late years many prominent surgeons prefer to perform the operation recommended by Bailey, and carried successfully into practice in a number of instances by my friend, Prof. James P. Tuttle, of New York. This consists in splitting the external oblique

muscle in the direction of its fibers and separating the fibers of the internal oblique and transversalis in the same manner that these muscular fibers are separated in the "gridiron" operation for appendicitis. The peritoneum being incised and the colon secured, it is brought through the wound. The skin at the lower portion of the incision is now dissected up for 2 or 3 inches from the abdominal wall in the direction of the groin, where it is a second time incised. The knuckle of bowel is drawn beneath this raised strip of integument and out at the lower wound, where it is held in place by the glass rod until adhesions occur. The knuckle is then incised and the artificial anus established in this manner. Wearing a truss-like pad on the skin which overlies the bowel-loop, prevents leakage when the patient is moving about. The formation of the extra pouch or loop of colon above the aperture applies equally to this operation as to any other method for the formation of an artificial anus.

REPAIR AFTER INTESTINAL RESECTION.*

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The title of this paper is misleading, in that it gives the idea that healing in the intestine is to be fully considered. I shall discuss the question of stricture following anastomosis, and especially end-to-end anastomosis. The other points in the healing process will be treated very cursorily.

The position which the paper advocates is that the danger from secondary stricture due to development of scar tissue in the submucosa and muscular tunics is very slight. This should be removed from the list of objections to operative procedures. I have been led to this opinion by two sets of observations. I have been confirmed in it by a tone that I find in the literature—illegally defined, but present.

The first observation is this: For ten years the profession has been doing anastomosis with great frequency. There has been time enough for the literature to teem with reports of secondary stricture. I have not found such abundance of reports.

The second observation is: I have examined with the unaided eye, and with the microscope, a great many specimens of intestinal union. These have been operated with the Murphy button, Frank coupler, the Connell and various other suture methods. I have not found distinct strictures. Harris says that the major amount of contraction after intestinal operations takes place during the first six months. In his case, no contraction having taken place at the end of ten months, he concluded that danger from that source was past.

As a further part of this observation, I have noted that the scar-tissue fibers occupying the region of the submucosa, muscularis and serosa are never circularly arranged. None but the circularly arranged fiber produces stricture.

Examinations of many specimens of intestines that had been resected show the following arrangement: The mucosa is commonly nearly perfectly arranged. Sometimes we find villi perfect in form directly in the line of union. Commonly the villi are not quite as symmetrical in arrangement as normal. Usually the crypts of Lieberkühn are quite natural. The surface epithe-

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