aluminium, as it can be made small, is light, has a definite strength so that one can do a definite work and know what to expect during a definite time.

We desire the connective tissue to hold at least for three days and prefer it to hold for five. My experiments on pigs proved that the dumb-bell is freed after from four to six days. The rubber ligature should be firmly wrapped around the tissues and the dumb-bell twice, then securely tied with several knots. The knots and ligatures are left within the canal, and the quantity of ligature can make no difference. The ligature material should be coarse, so that it will necrose through slowly, hence use a rubber band about one-fourth inch broad (or heavy-braided silk). Silk or linen sutures are not so safe as rubber in the hands of a beginner, as any sawing motion in applying the ligature might cut through and thus necessitate reamputation of the gut and a serious prolongation of the operation.

Operation for end to end approximation :— The two ends of the bowel are secured by a suture at the mesenteric border, care being taken to include in this suture the V-shaped mesenteric triangles. Directly opposite the mesentery, on the periphery of the intestine, another suture is placed. Each of these sutures is tied loosely, as they are only used for the purpose of invaginating the two ends of the bowel. Two inches from the end of the intestine, along its peripheral border, an incision is made through the intestinal wall one inch in length. This incision is made in the proximal end of the intestine, if it be enlarged, otherwise on the distal end. A pair of forceps is now passed through the incision and into the end of the intestine and the tension sutures secured and drawn through the incision. Now steadying the mesenteric border of the intestine between thumb and finger, and drawing the sutures invaginates the two ends of the intestine into each other and through the incision. The dumb-bell is now placed into the ends of the invaginated intestine and the ligature applied at a distance of one-half inch from the ends of the severed intestine, encircling it and the handle of the dumb-bell. Disinvaginate by gentle traction and pressure on the dumb-bell; reunite the peripheral incision by a Czerny-Lembert or Gely suture. Then complete the operation by suturing the mesenteric opening.

The three sizes of the dumb-bell can by the ligature method be made to fulfil any requirement in any operation from the cardiac end of the stomach to the rectum. In doing a gastro-dudenostomy an opening is made on the ventral wall of the stomach one and one-half inches in length. Through this aperture by means of a pair of forceps the dumb-bell is forced through the pyloric opening and dropped into the duodenum, where it can be pushed along by the hand within the abdomen to any selected point of the intestine, as the small omental cavity is opened for inspection, just as in any dorsal gastro-enterostomy.

If there be a stenosis of the pylorus, an incision must be made in the duodenum near the pylorus and the dumb-bell placed in the duodenum and this incision sutured. When the point is selected, with the right hand seize the dumb-bell from within the stomach with tenaculum forceps, then invaginate the duodenal wall and dorsal stomach wall through the former incision on the ventral stomach wall by pressing the ventral wall down over the dumb-bell. Tie a firm ligature of heavy silk, reinforced by a rubber ligature, to ensure uniform pressure and necrosis.

Precaution must be used in not selecting a dumb-bell of more than $\frac{1}{2}$ in. in diameter, or excessive amount of the peripheral side of the small intestine will be ligated.

For uniting the severed end of the ileum to the site of the colon, push the dumb-bell into the end of the intestine out of the way, throw a purse string ligature around the end of the severed intestine, and leave the needle threaded. Select the point of the colon for anastomosis; nearly opposite this point open the colon by an inch incision, preferably in the tenia coli. Now insert the needle at the previous point selected and pull it out through this incision, and draw the side of the sigmoid, and the end of the intestine into this incision. Now force the dumb-bell forward to the end of the intestine and place the ligature over the small end of the dumb-bell. Suture the opening into the colon and also the mesentery of the small intestine.

Where the cæcum has been amputated the work can be done through the end of the colon before it has been sutured. Experience has taught us that the small intestine should never be united end to end with the large intestine, but always lateral above a newly-made cæcum.

A specimen removed twenty-four hours after the operation showed absolutely no leakage, the ligature and dumb-bell were firmly in place and a safe protective band of lymph was becoming organised. Especially at the dangerous mesenteric border can the accurate union be noticed. The strangulated ends of the intestine external to the ligature were very much hypertrophied, and dilated the intestine over the small end of the dumb-bell. For this reason

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