

item in surgery, and is accomplished in one of three ways: by tubes of ordinary or soft rubber, glass of decalcified bone; by strands of catgut, or by gauze wicks. The tubes may be constantly kept in a solution of carbolic acid in water, one to forty, and may be removed from this solution for insertion into the wound. An ordinary glass jar for preserving fruits makes an excellent receptacle for the tubes and their solution. The decalcified bone tubes are not in general use.

Sterilization of the hands can be efficiently done by scrubbing them with soap and warm water—preferably running water—for several minutes. The nails should be thoroughly cleaned both before and after their scrubbing. Then the hands should be immersed for two minutes in 95 per cent. alcohol and finally for the same time in one to one thousand hot aqueous solution of bichloride of mercury. The operative field may be prepared after the same principle, only the field should be shaved and a moist bichloride of mercury dressing (one to two thousand) put on twenty-four hours before the operation if circumstances will permit.

As for the sterilization of the instruments there can be nothing more perfect than to submit the instruments to the action of boiling water for ten minutes. In order to prevent rust, a one and a half per cent. solution of ordinary sal soda in water is the best. The sal soda also increases the antiseptic powers of the heat. A teaspoonful of tincture of green soap to a pint of water also makes an excellent solution in which to boil instruments. Ten minutes is an abundance of time, and the solution should be brought to the boil before the instruments are placed in it. The instruments may be wrapped with a towel and a bandage the long end of the bandage being left out so as to remove them without difficulty. The asparagus boiler may be heated on the ordinary cooking stove or the small oil lamp may be used if more convenient. The instruments should be spread upon dry sterile towels, or upon towels which have been boiled and recently wrung by aseptic hands.

The instruments should be as sim-

ple as possible with as few screws and cranks as can be gotten along with, and should be entirely of metal. As alkaline solutions will act upon aluminum this metal is not desirable for the handles of knives unless nickel plated.

Sutures and ligatures are chiefly comprised under silkworm gut, catgut, silk, tendon, or silver wire. The silver wire can be boiled as the instruments are and so is simple of preparation. Silkworm gut may also be boiled with the instruments, though it is frequently sterilized and kept in alcohol. Silk should be prepared by getting ordinary floss or twisted silk, soaking this in ether for from one two days, to remove grease, and boiling it at the time of the operation, or else having it boiled and kept in sterilized glass jars in absolute alcohol, which is itself a slight antiseptic.

Tendons can be prepared as catgut is, and as catgut is usually the most desirable substance for general use as a suture or ligature, a great deal of importance attaches to it. The methods of preparation are numerous and most of them are effective, but the difficulty of practical application of any method which involves boiling in alcohol without a special and expensive apparatus is great.

I shall not weary you by detailing the numerous methods which are used, but shall give what I think the most practical, and the simplest one which procures satisfactory results. This method has been used by Professor Keen, of Philadelphia, for some years, and has been pronounced by him absolutely satisfactory. It requires no special apparatus. First the catgut is selected, numbers 1, 2, 3, 5 and 7 being what is most needed. The catgut can be obtained at most reasonable rates from one who furnishes jewellers' supplies. It usually comes in lengths of one metre. It should first be unwound from the coil and wrapped upon spools or pieces of glass rods, and then transferred to the best sulphuric ether, where it should remain for forty-eight hours, or longer. After it has been steeped in ether it should be immediately put in to a glass jar containing bichloride of mercury mixture consisting proportionately of 40