MODERN METHODS OF ANTISEPTIC Wound Treatment

PUBLISHED BY
JOHNSON & JOHNSON
NEW YORK.

A Compilation of
RECENT NOTES
and
SUGGESTIONS
FROM
EMINENT SURGEONS.

MODERN METHODS

—— OF ——

Antiseptic Wound Treatment.

COMPILED FROM NOTES AND SUGGESTIONS FROM THE FOLLOWING EMINENT SURGEONS:

D. HAYES AGNEW, M. D., LL.D.,

Professor of Surgery in the University of Pennsylvania, Philadelphia, Pa.

A. C. BERNAYS, M. D., M. A.,

Surgeon to Lutheran Hospital, and Consulting Surgeon to the City and Female Hospital, St. Louis, Mo.

JOHN B. DEAVER, M. D.,

Assistant Professor Applied Anatomy, University, Pa.: Professor Surgery, Philadelphia Polyclinic; Surgeon to German, Philadelphia, St. Agnes and St. Mary Hospitals.

JOHN D. S. DAVIS, M. D.,

Birmingham, Ala.

HUNTER McGUIRE, M. D., LL.D.,

Surgeon to St. Luke's Hospital, Richmond, Va.

THOS. G. MORTON, M. D.,

Surgeon to the Pennsylvania and Orthopædic Hospitals, Philadelphia.

N. SENN, M. D., Milwaukee, Wis.,

Professor of Clinical Surgery in the College of Physicians and Surgeons, Chicago.

STEPHEN SMITH, M. D.,

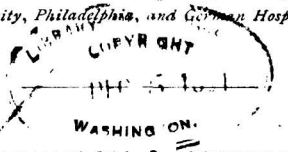
Surgeon to Bellevue Hospital, Professor of Clinical Surgery in the University of the City of New York.

LEWIS A. STIMSON, M. D.,

Surgeon to Bellevue Hospital, Professor of Clinical Surgery in the University of the City of New York.

J. WILLIAM WHITE, M. D.,

Surgeon to University, Philadelphia, and German Hospitals, Philadelphia.



Published by JOHNSON & JOHNSON, New York.

Printed by Jersey City Printing Co., 37 Montgomery St.

PREFACE.

The large favor accorded our little book "Modern Methods of Antiseptic Wound Treatment" having caused early exhaustion of the entire large edition, leaving a continued demand for copies of the same, we have undertaken the publication of this second edition, in which the matter of the first has been recently revised and considerably enlarged.

As explained in the preface of the first edition, the collection and publication of the matter contained therein was due to suggestions from eminent surgeons, as follows:

1st. That aseptic and antiseptic methods in surgery being of comparatively recent origin, most of the text books do not contain concise information concerning the details of their application.

2nd. That the publication of such information, together with some of the special methods practiced by our leading surgeons, and the recent improvements in the general method, would lead to a fuller appreciation of the value of asepsis and antisepsis in general practice, and prove interesting to the profession at large.

In consequence of the above suggestions, a considerable number of well known authorities were invited to contribute matter relating to the different germicides, dressings and other details, with comprehensive directions for applying them in private practice.

From material cordially furnished in response to the above invitation, and secured from other sources, this little book has been compiled.

The matter is such as has been sanctioned by the majority of contributors. Wherever exceptions have been received they have been noted.

JOHNSON & JOHNSON.

INTRODUCTORY.

Antisepsis and Asepsis have assumed important places in surgical procedure. The principles which underlie this cannot be successfully controverted.

"Aseptic Wound Treatment refers to treatment of a fresh wound to prevent its becoming infected. Antiseptic wound treatment is that applied to wounds already infected, to limit aseptic processes already established, and prevent further extension."—GERSTER.

The practice of Tait, the strongest opponent of Listerism, is as follows:

1. The highest degree of cleanliness and sterilization of rooms, patients, instruments, sponges and dressings.
2. Rigid attention to details by assistants, nurses, patient, securing the most perfect environment.
3. The use of large quantities of water, becoming antiseptics by quantity and force.
4. Short duration of operation, and in minimum exposure.
5. Exposure reduced by minimum of assistants and instruments.
6. Thorough drainage.

"Practically, we are compelled to use antiseptics in order to produce a condition of asepsis. Moreover, the most important role which antiseptics play in surgery, lies, not in their direct application to wounds, but it is found in their use as sterilizers of the surgeon's hands, and of his instruments and dressings."—A. C. BERNAYS.

Those who depreciate the fussiness of Antiseptic Surgery are those who operate under the most favorable conditions of environment with the most rigid asepsis, or else, whose limited practice seldom or never includes an important operation. The general practitioner is unable to secure the aseptic surroundings, skilled assistants, trained nurses and other conditions available to the specialist.

Simplification of details and improved appliances have rendered it possible to extend the principles of aseptic and antiseptic surgery to all conditions; to grave and minor injuries, in emergencies, and among unfavorable surroundings. The means may require modification, but the principles need not be deviated from.

Antiseptics must be used both in aseptic and antiseptic wound treatment. Cleanliness cannot be attained, much less maintained, without the aid of cleansing agents, or antiseptics—"angels of cleanliness." Perfect asepsis, unaided, is a myth. Perfect aseptic wound treatment, by the use of antiseptics, is an established fact.

SUPPLIES AND STORES

Are best kept in a separate room, closet, drawer or case. This, scrubbed, weather stripped, and calked, may be made a dustless and aseptic place for them. It should be arranged so as to be easy of access for use and ready cleansing.

Supplies should be in containers that will not allow of change or deterioration, and which will admit of the removal of just such a portion as may be needed from time to time, and no other portion touched.

When no other room can be given, a case as devised for Railway, Mining and Factory surgeons can be used. (*See figure 13, page 25.*)

THE OPERATING ROOM.

Any room may be prepared to fulfill the conditions by the removal of all useless furniture and fabrics, the carpet not disturbed, but covered with oil cloth or moist sheets.

ARTICLES NEEDED IN MODERN SURGERY.

Ordinary earthen bowls and dishes may be cleansed and utilized as receptacles for instruments, etc., as follows.

Washbowl for rinsing sponges or preparing towels; soup tureen for rinsed sponges; large platter for large instruments; small platter for small instruments; small bowl for artery forceps; saucers for needles, ligatures, sutures and drainage tubes.

For permanent use, granite ware is serviceable, cheap and readily cleansed. Tin, iron, or metallic ware may be made serviceable by frequent coatings of shellac or asphaltum varnish. Tinware thus coated is light and portable.

The Operating Table.—The ordinary kitchen table will generally answer; if not, there is a table in every house that will. Bricks or wooden blocks can be placed under two legs of the table in

order that the irrigating liquids may drain off to the pail used for catching them.

The floor of the operating room should be kept moist, so that the dangerous particles from suppurating wounds or other infectious matter will not rise into the air. No microbes rise from a moist surface. Spectators should be fenced from operating portion of room.
VON BERGMANN.

Abdominal work can be executed as well in the home of patients as in private hospitals. A thoroughly cleansed and airy room is the ideal location.—L. S. MCMURTRY.

I do not believe in general hospitals for this work, nor in the necessity of special hospitals in order to reach success. It has been demonstrated that it can be successfully done in courts and alleys of our large cities. If the home of the patient only contains two rooms, and one can be prepared and the operation done in a proper way under care, the result will be as good as in a hospital prepared for the purpose.
WM. WARREN POTTER.

The Irrigator.—A fountain syringe of about four quarts capacity, with a nozzle

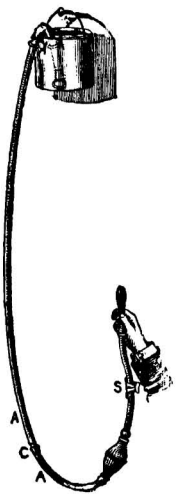


Fig. 2.


Fig. 3.-Thiersch's champagne bottle irrigator.

that will throw a strong, single stream. In cases of emergency, an irrigator may be improvised by knocking the bottom out of a bottle and perforating the cork for the passage of a tube. For frequent operations a douche pail may be made by insertion of a tube in the side of a wooden pail near the bottom and attaching a rubber tube.

Bichloride Solutions.—Compressed tablets of corrosive sublimate and ammonium chloride are most convenient for preparing bichloride solutions. These tablets are prepared so as to make, when dissolved in a pint of water, a solution of 1-1000. When the tablets are not used, the solution should be as follows:

Bichloride of mercury, - - - gr. 7.50
Ammonium chloride, - - - gr. 7.50

which, added to a pint of water, makes a solution of 1-1000

Do not put Bichloride solutions in metallic vessels. Dr. N. Senn prefers tablets of Corrosive Sublimate and Chloride of Sodium, each 15 grains, stained with analine blue.

Ammonium chloride is used to prevent the precipitation of calomel and the formation of albuminate of mercury when the fluid comes in contact with the living tissues.

Carbolic Solutions.—Liquefied carbolic acid in a small bottle is the most convenient form for use. One ounce in thirty ounces of water makes a 1-30 solution. Suitable for instruments.

"Corrosive Sublimate has the advantage over Carbolic Acid, in that carbolic acid provokes oozing, softens and dissolves blood clots: corrosive sublimate does not do this, and oozing stops by natural means. Carbolic acid irritates the Vaso Motor Nerves: Corrosive sublimate does not. The wound surface is thus given a rest at needed periods."—GERSTER.

The water used in solutions and for washing should be purified, a ready method being to boil, add from 2 to 5 grains of alum, and filter through absorbent cotton.

Dressings include absorbent cotton and absorbent gauze, both plain and antiseptically treated.

The antiseptic cottons and gauzes principally used are sublimated, carbolated and borated.

Lintine —The highly absorbent fabric known as Lintine is a marked addition to wound dressing materials. It is made by felting absorbent cotton fibres into thin sheets. It absorbs more readily than cotton or lint, and loose fibres that stick to wounds or clothing are avoided. The sheets can be readily cut into bandages, pads, tampons, or cushions of any shape or size wanted, and adapted to any form of dressing. It may be used to cover the patient's limbs, the bedding and tables, during the operation, as a substitute for towels, napkins or sheets; very useful to make a pencil or mop for throat applications, small surfaces or cavities, or as an absorbent for discharges, drainage, or emptying drainage tubes. Sanitary napkins, handkerchiefs for consumptives, or diaper cloths for children are among the uses suggested.

Dr. L. B Couch, Nyack, N. Y., suggests the following method of using Lintine in the place of adhesive plaster for covering and closing wounds: "Cut a piece of Lintine half inch wide, and a half inch longer than the wound. The wound is then dabbed with iodo form collodion, and the Lintine strip laid over it. This dries quickly, and holds the edges of the wound in coaptation. The whole may then be covered by a coat of collodion and the result is a perfect and smooth antiseptic dressing. By this method one is able to discard pins and sutures in many cases. Lintine makes a smoother and firmer dressing than anything I have ever used."

Rubber Sheet.—A piece of rubber cloth, six feet long by three feet wide, is required to drain off the irrigating fluids into the catch pail.

Ligatures.—For the purpose of tying blood vessels the only materials recommended, at the present day, are silk and catgut. The former is prepared in the same manner as the silk suture. Unless catgut be prepared with great care, minute precautions being taken

to render it aseptic, it will defeat the object of antiseptic operations. Recent experiments conducted by prominent surgeons have demonstrated that the dark colored or unbleached catgut ligatures are stronger and more reliable than the light colored, finely finished ones, for which reason unbleached catgut only should be used for ligature purposes. As the gelatinous matter of which catgut is largely composed is impermeable to oils, including oil juniper, the usual method of preparing catgut is considered inadequate to insure its sterility. The J. J. method is to sterilize the strings by subjecting them to a temperature of 175 degrees F. and placing them while at that temperature in bottles or packages containing oil juniper with corrosive sublimate, carbolic acid or other antiseptics.

The sponges are always a source of anxiety.—TAIT.

Kummel's plan of washing reef sponges in green soft soap and water, then placing them in carbolic solution 1-30, or bichloride solution 1-1000, is a good one.—HUNTER MCGUIRE, M.D., Richmond, Va.

Sponges.—Selected reef sponges are generally used in hospitals, but need considerable preparation to make them fit for use.

Unclean sponges are a prolific source of wound infection. Sponge tissue is a most delicately woven web of fluffy fibre, and in its meshes are lodged dirt, shells, seaweed, and the gelatinous slime flesh of the living sponge. No ordinary washing will remove these. Johnson & Johnson, following the suggestions of such authorities as Von Bergmann, subject their bleached and sterilized sponges to repeated processes of beating and washing; shells and calcareous matter are removed by acid baths, and, finally, all organic matter by oxidation, leaving only the sponge tissue, which, being sterilized by heat, is saturated with an antiseptic solution and placed in an aseptic package.

Gutta Percha Tissue—Is used to prevent the dressings on small wounds from drying too quickly; it allows the adhering of cutaneous margins before the discharge of serum from the deeper tissues has ceased. It is also used in connection with the rubber sheet to drain off the irrigating fluid.

Iodoform.—A small bottle of iodoform and an iodoform sprinkler are often required. A small glass salt-sifter, or pepper box, such as may be obtained at any house-furnishing store, will answer for a sprinkler. Select one with the smallest holes through the top. Remove the top and keep the bottle corked when not in use. The hard rubber iodoform sprinkler, though more expensive, is preferable on account of its convenience.

Drainage Tubes—Are used to allow the escape of blood, pus and serum, from wounds and abscesses. They are made of decalcified bone, rubber or glass.

The bone tubes are said to be completely absorbed in the wound in about ten days, which allows the wound to heal without removing the dressing.

The experience of the majority of surgeons is against bone drainage tubes. The glass and rubber tubes are deemed the best.

Rubber tubes should be made of natural, not vulcanized, rubber.

Catgut drains are used for small wounds, and are made by bunching strands of catgut together.

Esmarch's Bandage.—An elastic rubber bandage, usually 2½ inches wide and 5 yards long. It is used for the stoppage of hemorrhage and the depletion of a part, of blood. In amputations it is wound spirally about the limb, beginning at the distal extremity, each turn overlapping the preceding turn by one-half an inch.

Potash soap should be used exclusively, as it penetrates the epidermis more deeply than ordinary soap, and is thus better adapted for securing an aseptic condition of the skin.—PROF. N. SENN, Milwaukee, Wis.

Other Necessary Requisites—Are: a narrow, sharp razor, for shaving off the hairs around a wound; a nail brush, cake of soap, assorted gauze bandages, towels, binder and safety pins.

Important General Directions and Precautions.

Before beginning an operation, see that all things required are ready.

"You cannot take too many precautions."—TAIT.

"Scrub the arms with potash soap and water to the elbow, and immerse in a solution of bichloride of mercury to the elbow."—STEPHEN SMITH.

"Scrape the finger nails with a knife, rinse in alcohol, finally immerse in bichloride solution."—FURBINGER.

Hair and beard should be short, and moistened with bichloride solution.—GARRE.

"All heads should be covered."—ERILE.

"Nail brushes should not remain on washstand, but be kept in antiseptic solution, otherwise they are full of bacteria."—VON BERGMANN.

An aseptic operation requires the disinfecting of all persons engaged in the operation, of the operative region and its environments, of the instruments and accessories, and finally of the wound.

See that the table or tables for holding instruments, etc., are placed near the operating table and covered with towels, or strips of Lintine, wrung out in a 1-2000 bichloride solution or a 1-30 carbolic solution.

On this should be placed the dishes for holding the instruments, needles, etc.; these should be filled with a 1-30 carbolic solution, in which the instru-

ments, needles and sutures should be placed at least half an hour before being used.

For instruments and other accessories, moist heat is an efficient sterilizer, and before and after each operation they should be cleansed. Syringes and hollow instruments filled with water, large instruments separately wrapped in gauze, small ones placed in gauze bags completely covered with water, the vessel covered and kept boiling for five minutes before coming to the operating table. They can be handled with gauze and dropped in trays under water or solutions, during the operation.

Hang the irrigator high enough above the operating table to make it convenient for use, and fill it with the solution you are going to use.

Two or three gallons of bichloride solution will generally be required and should be prepared. Instruments are not placed in bichloride solution, as it dulls them.

The hands of the operator and his assistants should be thoroughly washed in a 1-1000 bichloride solution before the operation begins, and rewashed when any unprepared object is touched accidentally or otherwise during the operation.

Some Surgical Don'ts.

"Don't do any operations with suspicious hands. Hot water, soap, nail brush and penknife should be carefully used by the principal and his assistants before any operation.

Don't, just before or during an operation, put the fingers about your nose, eyes or ears, or use a handkerchief, or shake hands with anyone.

Don't pick up, or allow an assistant to touch any instrument, sponge or suture that has fallen to the floor during the operation.

Don't bite off the end of a suture.

Don't put a knife or other instrument in the mouth or behind the ear.

Don't cough or sneeze over the operative field.

Don't fail to have the patient bathed, the field of the operation thoroughly cleansed, and, if necessary, shaved before operation.

Don't allow visitors to handle the field of operation after the patient is prepared, unless they are aseptic."—DR. A. MORGAN VANCE.

The region to be operated on must have all dirt and foreign matter removed, and for quite an area beyond the operative field thoroughly cleansed, the table rests and the clothing of the patient covered, and limbs not necessarily exposed, done up in antiseptic cloths. With a nail brush thoroughly scrub the field of operation with soap and water, shave the same area, then apply ether to dissolve the fatty substance and to remove the epidermis; now scrub with a 1-1000 solution of bichloride, and finally cover that part of the patient, table or clothing that might be touched with hand or instrument, with towels, or Lintine strips, wrung out of bichloride solution; a piece of antiseptic gauze should be laid on the immediate field of operation, and removed just before the initial incision is made.

Sponges, dressings, instruments, etc., should be handled with great care by the surgeon and his assistants.

Disinfected safety pins are used to prevent drainage tubes from disappearing beneath the skin.

After inserting a tube, the part projecting above the skin should be cut off and the safety pin passed through the end at the surface.

Care should be taken to bring the parts into accurate apposition, also to avoid tension, especially of the edges of the wound of damaged or unhealthy tissues.

While the wound is open, it should be kept wet with the irrigator controlled by an assistant.

A dressing should not be changed because serum has oozed through it. Place carbolized or other antiseptic cotton over the moist places and allow it to dry.

Dressings, in some cases, are not interfered with until the wound heals. They are, however, changed before the wound heals, in the following cases: 1st, to remove drainage tubes; 2d, when high temperatures show that some antiseptic rule has been violated; 3d, when plastic operations are done; 4th, when secondary hemorrhage occurs, or when the patient suffers severe pain.

Iodoform.

"In a general way I believe the great value of iodoform as a dressing lies in its extremely slow solubility, and that iodoform poisoning is far less common than generally supposed. The danger now lies in this very valuable agent being discarded on this account; the medical press repeating the statement that germs will grow in dry iodoform, without comment. This is of course true, but equally so of dry bichloride of mercury, the most powerful of all germicides. All the preparations used as antiseptics to be of value must be in solution."—H. O. MARCY, M. D., College and Clinical Record.

Action of Iodoform.

"Iodoform exerts a great formative influence on the smaller vessels, and these soon begin to grow out and multiply in an extraordinary manner by constant production of offshoots and capillary loops. The energetic growth of living tissue seems to rob the microbes of their nourishment. In the struggle for existence they succumb to the growing cells of the vessel walls."—BILLROTH.

A temperature of 101 deg. F. will frequently follow an operation and remain for a few hours. Hence it is not advisable to change a dressing, unless this temperature is shown 36 hours after an operation. If marked inflammation about the wound then exists, the antiseptic dressing must be changed daily, or even oftener. The main point to be observed in renewing dressings is, give the patient absolute rest as far as possible, not changing oftener than required.

When a rubber or glass drainage tube is used, it should be gotten out in one or two days, and the wound redressed.

When dressings are changed, the second dressing should be applied with the same care as the first, following the same general rules.

The patient's general health should be attended to. A supply of good food and fresh air should be given, in this way promoting the resisting and healing power of the tissues.

"Iodoform should be used very cautiously on the young, and on granulating surfaces. Instead of dusting iodoform in a wound, it is better to spray the surface with an ethereal solution of iodoform."—LEWIS A. STIMSON, M. D., N. Y.

Iodoform is used to dust about the mouths of drainage tubes and over the surfaces of wounds that are to remain open; also along the line of sutures. It is not dangerous, unless too much is used. In open wounds enough should be used to barely cover the surface and no more.

THE ORGANIZATION OF AN OPERATION.

ADAPTED FROM THE METHODS OF

W. W. KEEN,

Professor of the Principles of Surgery, Jefferson Medical College.

In order that the family, the physician and nurse will know exactly what will be expected to be in readiness, and all needed preparations made before the arrival of the surgeon, Dr. Keen has devised a schedule of directions which are used in the form of an operation blank as follows: By checking such items in the list as may be needed for the case in hand, definite directions are given to the person whose duty it will be to provide such articles, and make the needed preparations. Such a system prevents the omission of any detail or appliance that, being considered of minor importance, might be forgotten, but the absence of which would be annoying.

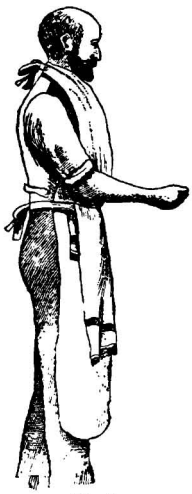


Fig. 4.

Dr. Keen's mode of using a sterilized sheet instead of an apron, the upper end being turned next the chest and over the bandage around the neck. The towel and bandages are also sterilized.

If the directions are followed, everything will be ready, wrappers taken off the bottles, corks and lids of gauze cans loosened, and everything so arranged that the surgeon has only to arrange and prepare his instruments, needles, sutures, etc., and proceed without loss of time.

*OPERATION BLANK.

.....18

For the operation on M.....
residing at.....on.....
.....at.....o'clock, please see that such of the following preparations as are checked are all made beforehand.

(Surgeon's name.)..... .....

I. THE PATIENT.

1. The day before the operation, shave the parts; scrub well over a wide area with soap and water; then with ether; then

*Copies of these blanks, arranged for surgeons' use, with room for additions and alterations, will be furnished by JOHNSON & JOHNSON, free of charge, on application.

with a sublimate solution, 1-1000; then apply a sublimate gauze dressing and bandage, and let it remain in place until the operation.

2. See that the bowels are opened by a gentle purge given the previous evening, and, if need be, by a morning enema.

3. Wash out the vagina and rectum.

4. For breakfast a cup of clear soup (no bread or other solid food), and no food later.

5. Have patient in bed (in an adjoining room, if possible) a half-hour before the operation, with night dress, chemise, or undershirt, drawers, and stockings only.

II. THE ROOM AND BED.

1. Take up the carpet, remove curtains, draperies, and all furniture except a bureau, washstand, table, and two cane-seat or wooden chairs; clean the room; clean the walls and ceiling with a brush or broom covered with a towel; then wash the floor, woodwork of walls, and furniture with carbolic solution, 1-40; have clean carpet strips ready to lay on the floor after the operation.

2. A firm four-legged table, with three old blankets and a pillow in front of a window (north light preferred).

3. Remove the window-curtains, and screen the lower sash by paper or towels.

4. Four small tables for instruments, dressings, etc.

5. Protect the floor.

6. Two blankets on the bed instead of sheets.

7. Protect the bed by rubber cloth and a draw sheet.

8. Ten hot-water bottles well corked.

9. Hoops to support the bed-clothes.

10. Waste water bucket.

11. Five china basins and one tin basin.

12. Three sheets and fifteen towels, wrung out of sublimate solution, 1-1000. the night before the operation and rough-dried or only moist.

13. Two dozen large safety-pins.

8. To use in applying warmth to patient.

11. One for washing the hands and forearm before operation, second for alcohol with which to cleanse hands, the third for hot bichloride solution for use after alcohol, the fourth for sponges, the fifth for hot bichloride solution to cleanse hands during operation.

12. The sterilized sheets and towels (Sec. II., No. 12) are for use as aprons (see figure); to surround the field of operation; to pin around the patient's arm, hair, etc., and around the Allis' inhaler.

14. Tumbler, tablespoon, and teaspoon.
15. Nail-brush.
16. Two pitchers of cooled boiled water.
17. Plenty of hot water.
18. A sheet of stout wrapping-paper for the Allis' inhaler.
19. 1½ yards of white flannel for a binder.
20. Fresh clear soup and milk.
21. Olive oil, two ounces.
22. A pint of vinegar (to cleanse the hands after the operation)

III. DRESSINGS, ETC.

1. Cans. Yard sublimate gauze.
(Johnson & Johnson).
2. Cans. Iodoform gauze.
(Johnson & Johnson).
3. Packages absorbent cotton.
(Johnson & Johnson).
4. Packages borated cotton.
(Johnson & Johnson).
5. Bandages, assorted.
6. Antiseptic lambs' wool.
(Johnson & Johnson).
7. Bed-pan and urinal.
8. Catheter.
9. Thermometer and temperature chart.
10. Hypodermic syringe.
11. A bent glass feeding-tube.

IV. MEDICINES, ETC.

1. Carbolic acid (No. 1), fl ℥ vss. in a half-gallon bottle of distilled water.
(To be diluted with hot water for instruments).
2. Carbolic acid (No. 1), fl ℥ vj.
3. Two ½ pound cans of Squibb's ether.
4. Chloroform, fl ℥ iv.
5. Liq. morph. sulph., fl ℥ j.
6. Four suppositories, 1 grain opium each.
7. Spirits ammon. aromat., fl ℥ j.
8. Alcohol, Oj.
(For cleaning hands and nails).
9. Ten-grain powders of sulfonal, No. iv.
10. Brandy, fl ℥ iv.
11. Lime-water, fl ℥ iv.
12. Sublimate tablets for 1-1000 solution; one bottle.

COTTON FIBRE IN WOUND DRESSING.

The white fibres that cling to and surround the seed of the cotton plant are important factors in wound dressing, as the source of absorbent cotton, lint, gauze and bandages.

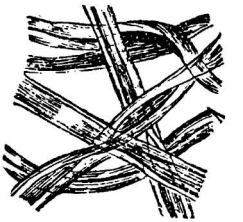


Fig. 5. Cotton Fibre.

Fig. 6. End of Cotton Fibre enlarged.

Cotton fibres, as seen in raw cotton, consist of collapsed tubes twisted and bent in all sorts of shapes. These tubes and the whole structure are filled with wax, resin, oil, pectose and coloring matters, which must be removed to render the cotton absorbent and fit for surgeons' uses.

JOHNSON & JOHNSON'S process of preparing absorbent cotton, includes some 20 handlings and processes, such as opening, picking, beating, carding, cleaning, extracting, bleaching, sterilizing, etc., requiring 14 days from start to finish. Their product is sterilized and absorbent.

The pioneers of modern methods of dressing used non-absorbent cotton fabrics. Lister's earliest dressings were covered with paraffine, resin and oil, and made repellent to absorption of wound discharges. In the authoritative methods of the United States Dispensatory and National Formulary the products are unsatisfactory, dry, harsh, stiff and non-absorbent, totally failing to meet the requirements of the practitioner.

"If mercurial dressings are used dry, the mercurial salt having no vitality and having therefore no power of destroying any micro-organisms in contact with it, however obtained, there is no security that the dressing when applied is free from living organisms.

This important object could, however, be infallibly obtained, if the dressings were kept and used moist with an efficient germicidal solution. I put this idea into practice, and during the two years that have since elapsed have never on any occasion had to complain."—LISTER.

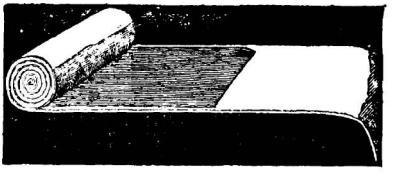


Fig. 7.

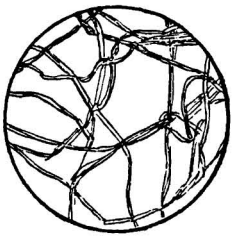
"All dry antiseptic bandage materials contain, without exception, more or less micro-organisms which are capable of producing putrefaction; but properly prepared moist gauze can be considered free from germs."—SCHLANGE.

It has been found that dry fibre in gauze or cotton, though charged with a germicide, does not prohibit existence and growth of micro-organisms; that dry cotton fibre, through which an antiseptic drug is distributed, is not impregnable against germs;

that they will retain their vitality as long as the antiseptic does not enter their organism. The fabric must be charged with antiseptics so as to receive, hold and destroy any organism that may come in contact with it. To do this the antiseptic must be in solution.

Fig. 8.

Borated cotton by the dry process. Crystals seen in spots.



Borated cotton by Johnson & Johnson's moist process. No crystals.

Examined under a microscope, a sample of boracic acid cotton carefully prepared by authoritative methods, such as practised by most manufacturers, will show that, in the process of drying, the boracic acid crystallizes unequally in spots, and in some samples none can be found except on the outer edge of a bunch where it crystallizes in masses. In the moist dressing, where the acid is held in solution, its crystals are nowhere visible. In dry corrosive sublimate cotton made carefully by authoritative processes and dried, the appearance of mercuric salt crystals under the microscope will show the crystals to be unevenly distributed, and that infectious organisms could be held by the dressing without coming in contact with the antiseptic. All germicides are not soluble, nor do they give reaction in blood serum, and septic conditions would be possible. In the moist process, mercuric chloride is held in perfect solution, and unchanged chemically.

In bichloride of mercury gauze, unless carefully kept in a damp condition, the bichloride will soon become changed into calomel. In fact, even in freshly made but dry gauze, a large amount of calomel will soon be found, and this and the remaining unchanged bichloride can be shaken out of it; germs also find a lodging place in the dry gauze.—ROBERT T. WIER.

The great objection to ordinary sublimate gauze as it is employed in most hospital wards, is that as kept in the usual way (dry) it is not free from germs.

This difficulty is overcome by keeping and using dressings in a moist condition. — JOHN B. DEAVER.

It is not sufficient to merely wet an ordinarily prepared gauze or dressing to have its conditions perfect. Such gauzes are now on the market under the name of moist or wet gauzes; they are simply dry gauze dipped in water, without regard to holding the antisep-

tic in solution, and the method of dipping prepared dry dressing in water before applying gives the liability of washing out the drug, and the dressing becomes simply a wet bandage.

In wound dressing, moist antiseptic cotton as well as gauze has been adopted by careful surgeons in preference to plain absorbent cotton.

Moist dressings favor rapid and thorough absorption, so that the wound discharge is constantly carried to active antiseptic material, and, if septic or fetid, at once rendered innocuous.

Fig. 9. Glass Container (J.&J.) for Antiseptic Moist Gauzes; aseptic and air tight; permitting no contact of gauze with metallic substances. See page 41.

A dry sponge, though most absorptive material, will not, when thrown upon water, rapidly absorb and sink, but will, if first wetted and then wrung out, absorb water and sink instantly.

The dry process of preparing dressings has been superseded by the moist method which Johnson & Johnson, as manufacturers, were the first to employ and generally introduce. Experience has shown that moist dressings are sterile and aseptic, absorptive, soft and pliable; that the antiseptic is not affected by heat or exposure to atmosphere; that the fabric is so charged that no micro-organism can exist within it, and every part of its structure is filled with a definite measure of the antiseptic drug in solution. They are so packed as to secure a minimum amount of exposure to septic conditions.

Dry dressings have slow absorptive powers. The layers next the wound become saturated, weakening the germicidal powers so as to require frequent change, else they decompose and septic material is in contact with the wound.

Where it is desired to admit dustless and sterilized air to the wound surface, it can only be accomplished by a moist antiseptic dressing, as a plain or dry dressing will allow dust to pass through.

Special Application of Antiseptic Methods and Moist Dressings.

Incised Wound in the Fleshy Part of the Forearm.

Illustrating the methods employed at Bellevue Hospital by Professor Stephen Smith, Surgeon to Bellevue, etc.

Such wounds are often deep, and extend well down into the muscles of the part.

After proper antiseptic cleansing, the spouting arteries are ligated with prepared antiseptic catgut and the wound constantly irrigated with the bichloride solution. If the radial or ulnar artery has been severed, each end should be ligated with prepared silk

ligatures. In closing the wound, divided tissues should be carefully united by sutures. A prepared drainage tube is placed with one end reaching to the bottom of the wound, and the other extending from its most dependent portion. Sutures of prepared catgut should be used to bring the edges of the severed muscles together, and heavier prepared catgut to hold the edges of the skin and superficial fascia in apposition. Iodoform is then dusted on the wound and the dressing applied, consisting of a thick pad of iodoform gauze, two inches wide, and an inch or more longer than the wound, a hole being cut in one end to admit of the projecting end of the drainage tube to pass through; a mass of gauze is placed over this, and the whole forearm wrapped with bichloride gauze padding; this is enveloped in a thick layer of absorbent cotton, which is retained in position by several layers of moist bichloride gauze bandage. The first dressing should be removed in about eight days, the wound irrigated with sol. bichloride and a second dressing similar to the first applied, and allowed to remain an equal length of time.

Amputation of the Thigh After a Railroad Crush.

Method of Dressing in use at the University, Philadelphia, and German Hospitals, by Prof. J. Wm. White, Philadelphia.

After properly arranging clothing, attending to general condition of patient, arrest of hemorrhage by use of tourniquet or Esmarch's bandage, proceed as follows:

1. Wash over the whole limb, first shaved clean, (*a*) with soap and water, (*b*) with alcohol, turpentine or ether, and (*c*) with 1-500 bichloride solution. The hands of the operator and his assistants should be treated in a similar manner. The wound and crushed area may, with advantage, be washed with a chloride of zinc solution of 10 to 20 grs. to the ounce. These measures are especially necessary in such cases, on account of the dirt ground into the recesses of the tissues.

2. Cover the bed with a rubber cloth, wet with 1-500 bichloride solution, and encircle the sound part of the limb and all portions of the crushed regions with towels wet with 1-1000 bichloride or 1-20 carbolic solution.

3. Use only instruments which have been boiled after last use and have been lying in 1-20 carbolic solution not less than fifteen minutes.

4. Tie everything with catgut or with silk which has been carefully boiled and soaked in carbolic or sublimate solution. Use rubber drainage tubes taken direct from such solution and put in place while dripping. Sew with catgut, or silver wire, or silkworm gut, but in either case the suture material must be taken direct from the antiseptic solution.

5. Dress with (*a*) protective over the line of wound, (*b*) iodoform on whole stump, (*c*) wet dressing of at least eight layers sublimate gauze, (*d*) moist dressing with iodoform over inner surface, (*e*) salicylic or sublimate cotton, (*f*) gauze bandages.

More recently Dr. White has employed the following dressing in a large number of cases and with most satisfactory results:

Immediately over the wound place six or eight layers of "double-cyanide" gauze (see an article on "The Latest Listerian Method in the Dressing of Wounds," *Medical News*, November 30, 1889) which has been wrung out once or twice in a solution of 1-20 carbolic acid. Above this place successive layers, 10 to 20 according to the amount of oozing or discharge expected, and outside of this ordinary bichloride absorbent cotton. This dressing is said by Dr. White, in the article above referred to, to have the following advantages: The double cyanide of zinc and mercury, which is the active agent in the gauze, is non-volatile, unirritating, insoluble in water, only soluble in 3000 parts of blood serum, and finally while it possesses but little germicidal value, its inhibitory power is so high that a solution of 1-1200 is sufficient to keep animal fluids permanently free from putrefaction. The deficiency in germicidal power is remedied by including in the dressings a small percentage, 1-4000, of sublimate.

Amputation of the Forearm—(Crushed between cars) when injury to the bones and soft part is so great that amputation is considered necessary.

DRESSING.

Suggested by D. Hayes Agnew, M. D., L. L. D., Professor of Clinical Surgery at the University of Pennsylvania.

The operation should be done with antiseptic precautions under constant irrigation with sol. bichloride, 1-2000; the arteries ligated with No. 7 prepared catgut. Silkworm gut, or silver wire, for suturing the flaps; prepared rubber drainage tubes being employed for drainage. Don't use bone; they will collapse and fail to drain. Prepared antiseptic sponges should be used throughout

the operation. The wound, after being dusted with iodoform, should be covered with oil silk protective, which should be perforated with holes for the passage of the exposed ends of the drainage tubes. Cover this with either a pad of moist bichloride gauze or carbolized gauze, over which place a second dry pad of the same material, and lastly, a layer of absorbent cotton, and secure with bichloride or carbolized roller bandage. The dressing should be removed under the same antiseptic precautions, as soon as the discharges show through or the temperature rises.

Contused Wound of Scalp.

Dressing Suggested by Professor Lewis A. Stimson, Surgeon to Bellevue Hospital.

The hair should first be clipped away for a distance of an inch and a half all around the wound, and after that portion of the scalp has been thoroughly scrubbed it should be shaved, and irrigated with bichloride, 1-2000. The clot should then be removed from the wound, the ragged edges of which should be trimmed away until a fresh surface remains. Care should be taken to remove all foreign particles, especially hairs, from the wound, which should be frequently irrigated with sol. bicloride. Several strands of heavy prepared antiseptic catgut may be introduced to the bottom, for drainage, if the wound is deep. The wound is then closed with interrupted sutures of prepared catgut. A pad of iodoform gauze is then placed over the wound and over this a large pad of moist bichloride gauze, and the whole retained in place by a gauze bandage. This dressing should be removed at the end of a week, unless the dressings become soiled, in which case they should be removed sooner.

Dressings for Scalp Wounds.

Suggested by Dr. J. T. Woods, Prof. Surgery Toledo Medical College.

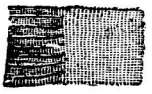
After suture, a narrow pledget of moist cotton, medicated with any desired medicament, is made just wide enough to cover the cut and abraded surface. This lies next the wound; over it a mass of absorbent cotton sufficient in size and thickness to secure warmth and receive any discharge that may occur. In the place of a roller bandage take a piece of oil silk sufficient in size to well cover the cotton, and in the centre of either end cut out a triangle of proper dimensions (usually about one inch at the base and two inches long), overlap the edges and stitch together in a cup shape (may be pierced with apertures for ventilation), an elastic cord attached to either end. It is then placed over the cotton dressing and the cord passed under the chin

Fig. 10.

or wherever desired. See Fig. 10. This dressing is more easy of adaptation, and more sightly than the roller bandage.

Skull Bandage.—Susceptible of adaptation to forehead, top or back of head when a large surface is scalded or injured. The medicated dressing of gauze or lint (sometimes muslin covered with ointment or poultice) is cut long enough to extend each way over the surface involved. The lower border is drawn down to the surface, the upper border is cut into many tails, adjusted to overlap and fit the surface completely. See Fig. 11. Over this may be placed cotton for absorption, if required, and the whole kept in place by a retentive bandage of muslin, taking a piece about twenty-four inches long by six wide, tearing it lengthwise into tails about 1½ inches wide, leaving four inches in the middle each way. Fig. 12. This is placed in position by adjusting one border across the forehead as low as desired, carrying the lower tail around the head over the ears to the back of the head, fastening in the depression below the protuberance. The next pair are laid smoothly and pinned to the first and this continued till it is adjusted. The last pair will probably come so as to fasten under the chin, or may be carried back as were the first.

Fig. 11.



Johnson & Johnson's gauze is folded so as to form about the right width, and may readily be cut to fit.

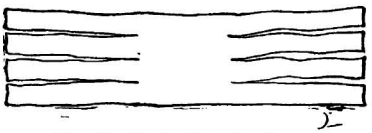


Fig. 12. Muslin Head Bandage.

Lacerated and Contused Wounds.

Such as: the wheel of a wagon passing over leg, lacerating the tissue without breaking bones. Revised by N. Senn, M. D., Milwaukee, Wis., Professor Principles and Practice of Surgery and Clinical Surgery, College Physicians and Surgeons, Chicago.

The patient should be placed upon the operating table and anæsthetized. The clothing should be removed from the limb, which should be scrubbed thoroughly with potash, soap and water; the leg shaved and then irrigated with sol. bichloride, 1-2000. After the surgeon has arranged the antiseptic rubber sheet for drainage, his hands should be rendered aseptic; and the instruments necessary for the operation placed in sol. ac. carbolic, 1-30. The foot and thigh should be enveloped in carbolized towels, 1-30, several towels being placed to receive instruments when laid down. It may be found that although the external wounds are small, considerable damage has been done to the deeper structures, and that there are several large accumu-

lations of blood in pockets extending in different directions. These pockets should be opened freely under constant irrigation, and the clots turned out; prepared antiseptic sponges being used throughout the operation. Large antiseptic rubber drainage tubes should be introduced to the bottoms of all the pockets, and the edges drawn together as far as possible by means of prepared antiseptic silk sutures. The wound is then dusted with iodoform, and an antiseptic dressing supplied as follows: A large pad of iodoform gauze, perforated with holes for the passage of the ends of the rubber drainage tubes, is placed over the wound; this is covered with a large mass of bichloride gauze, and the whole leg, from ankle to knee, enveloped with a thick cushion of sublimated cotton, the whole dressing being held in position by means of several layers of moist bichloride gauze bandage. This dressing should be left in position until the discharge begins to show through, when it should be renewed. The drainage tubes should remain in the wound until there ceases to be any discharge from the pockets. All subsequent dressings should be applied under the same antiseptic precautions as were taken with the first.

Antiseptics in Minor Pelvic Operations.

Leroy Brown, M. D., House Surgeon to Woman's Hospital, N. Y.

"If the operator has not all the instruments and appliances for such purpose, he need not be deterred; the curved scissors, needle holder, dressing forceps, artery clamp and tenaculum of the pocket case will suffice. Clean them with soap and water and boil them in a clean vessel for an hour, needles and all. In boiling it is convenient to tie them in a piece of gauze and let the end hang out of the boiler; this is convenient to take them out by. They can be placed on a towel and not handled till the time of operation. Well prepared antiseptic sponges and prepared ligatures, silk or silver, are all that are necessary. The operator's and assistant's hands are made aseptic. The vulva is shaved and washed, the vagina drenched with bichloride solutions, and the operation performed. At its completion, the parts are well dried with absorbent cotton or gauze and the entire vulva covered with a moist gauze pad of bichloride of mercury held in position by a "T" bandage."

Obstetrics.

Methods of Antisepsis employed at N. Y. Maternity Hospital as practiced by Dr. Garrigues.

When labor commences, the patient is brought into the delivering room, and an ox gall enema is given, the bladder catheterized, the genitals washed with warm solution of bichloride of mercury, 1-2000, a vaginal douche (creoline solution one per cent.) applied, the patient placed on a delivery bed, and the vulgo-vaginal opening closed with a piece of moist lint, (bichloride mercury, 1-2000.) A porcelain crock containing a one per cent. solution is kept by the bed, and the accoucher's hands bathed therein before each examination. In normal labor after the delivery of the child and expulsion of the placenta the genitals are washed in the bichloride solution (no after douche is given) and the urine drawn by means of a catheter. Over the vulva a pad is placed made as follows:

1st.—A piece of moist lint (bichloride, 1-2000), 6 x 8, folded lengthwise so as to be three inches wide.

2nd.—Over the lint, a piece of muslin, 9 x 4 inches, bending the edges forward on the inside of the thighs.

3d.—A piece of muslin 18 inches square, folded diagonally, so as to form a boat-shaped bandage about four inches wide. This is filled with borated cotton and fastened to the abdominal binder by four pins in front and behind. These dressings are continued as long as the patient is in bed.

Railroad Injuries.

Railroad injuries, such as compound fractures involving the joints, are attended by more or less destruction not only of the bony tissues, but also of the soft parts in the vicinity of the injury. Such injuries are commonly accidents which happen to brakemen in coupling cars, in which the elbow is caught between the "draw-heads" or "deadwoods" of a pair of cars, resulting in an extensive fracture involving the elbow joint with extensive laceration and bruising of the soft tissues.

Another form of accident involves the ankle joint, the foot being caught beneath the wheel or pinched by the brake block. In one case a man fell between the trucks, his foot falling so that not the crown of the wheel but the flange passed across the outer and dorsal surface of the foot, opening the ankle joint, but not cutting through the tendon Achillis, though tearing the skin as far as the inner edge of that tendon. In other cases the limb is involved a little higher up, also opening the joint and crushing the astragalus.

First, cleanse the wound thoroughly, removing fragments of bone, of devitalized skin, of wood or iron,—everything foreign or liable to be septic. Then the limb should be thoroughly dressed antiseptically, after being carefully washed in some solution, such as bichloride of mercury, 1-1000 or 1-2000. The limb is then carefully put up in an antiseptic dressing, carefully but loosely applied, so as not to constrict, but to protect the wound. If there is any tendency of the tissues to fall into such a shape that there will be pockets, I have no hesitancy in making counter openings and introducing whatever number of drainage tubes may be necessary to secure proper discharge of the secretions. Now, having done this, the limb is placed on a splint, care being taken that there is no constriction of any part and that there is no tight bandage. The first dressings should be of sublimated or iodoformed gauze; borated or carbolated cotton is also applied on top of this to protect the wound by placing around it a sufficient amount of absorbent material to exert a very moderate degree of elastic compression and to prevent constriction.

Usually, at the end of twenty-four hours the first dressing should be changed. The second dressing should be applied just as the first. After this second dressing, it is usually unnecessary to replace the dressing for seventy-two hours or longer. A finger or toe should be left uncovered by which you can ascertain the condition of the extremities. This plan should be carried on until the whole surface of the wound is cicatrized. The dressing does not require changing more than once in four or five days.—Dr. James McCann in Medical Lancet.

Railroad Station Supply Case.

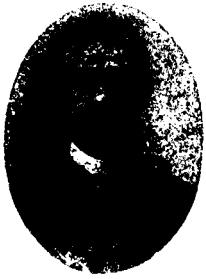
For Antiseptic Dressings and Surgical Supplies.

To meet the demand for a practical base of supplies for the use of Railroad Surgeons, Johnson & Johnson have devised the case or chest illustrated herewith, which is intended to be placed in charge of station agents at railroad stations, and is designed to contain supplies sufficient not only for minor injuries, but also enough for a number of serious accidents.

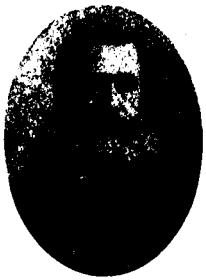
This case is substantially made, and will stand transportation and usage. It is provided with a lock and three keys, and a printed list of its contents is attached to the inner side of the cover, so that the station agent will be able to keep its equipment complete.

For use in mills, mining camps, factories, etc., we have arranged a similar case, accompanied by simple directions as to what to do

D. Hayes Agnew, M. D. Phila.



J. William White, M. D., Phila.



Thos. G. Morton, M. D., Phila.

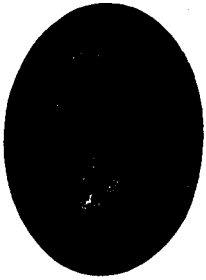
Jno. B. Deaver. M. D., Phila.

Sir Joseph Lister, Bart., F. R. S.

Prof. R. Virchow, Berlin.

Prof. E. Von Bergman, Berlin.

Prof. Oscar Liebreich, Berlin.



Prof. Von Esmarch, Kiel.

Some of the World

Nicholas Senn, M. D., Milwaukee.

Wm. H. Pancoast, M. D., Phila.

Stephen Smith, M. D., N. Y.

Prof. Robert Koch, Berlin.

H. McGuire, M. D., Richmond.

A. C. Bernays, M. D., St. Louis.

Prof. Leyden, Berlin.

Prof. Th. Billroth, Vienna.

Prof. Carl Gerhardt, Berlin.

's Greatest Surgeons.

while awaiting the arrival of the surgeon. When the surgeon arrives, in this case, if kept filled, he finds just what he needs.

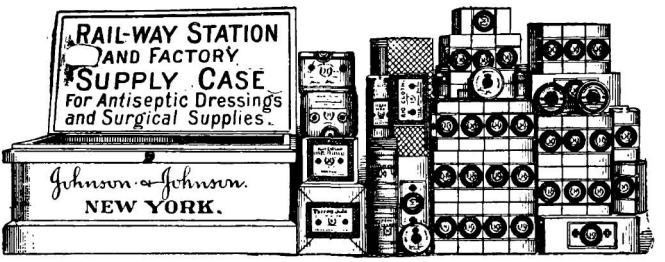


Fig. 13.

In adopting the following list of contents, the suggestions of several surgeons eminent in railroad practice have been followed:

CONTENTS.

2 lbs. Absorbent Cotton (ozs.)
1 lb. Absorbent Cotton (¼ lbs.)
1 lb. Tarred Jute.
1 ounce Styptic Cotton.
1 lb. Bandages, assorted sizes.
4 Esmarch's Bandages, angular.
1 5-yd. Roll in tin box Moist Sublimate Gauze.
1 yard Moist Iodoform Gauze.
1-6 doz. bots. Bi-chloride Mercury Tablets.
24 Antiseptic Sponges, in glass jars.
1 bottle (3 sizes Catgut Ligatures).
1-6 doz. Surgeons' Rubber Adhesive Plaster, on spools, ½ inch wide x 10 yards.
1-6 doz. Surgeons' Rubber Adhesive Plaster, on spools, 1 inch wide x 10 yards.
1 5-yard roll Rubber Adhesive Plaster, on spools, 7 inches wide.
1 bottle Silk Ligatures, assorted sizes.
1 Agate Ware Dish, size 4 inches deep, 12 long, 8 wide.

Minor Injuries of the Hand, Etc.

Pressmen, laborers in machine shops and manufactories constitute the mass of sufferers from these injuries. The hands are necessarily septic, the wounds usually contused and lacerated, and not unfrequently has the foreman stopped hemorrhage with pitch or turpentine, or the druggist with Monsel's solution and adhesive plaster, and the patient enveloped the member in some old rags to keep from "catching cold" in the wound.

The hand should be thoroughly washed with soap and water, the wounded surfaces being protected with bichloride gauze. Then irrigate with bichloride of mercury solution, 1-1000, the raw surface receiving scrupulous attention; all irritating and foreign substances being removed, shreds of dead tissue detached, and hemorrhage checked by the catgut ligature, hot water or hot bichloride solution, 1-2000.

Attention to details is just as important in small operations as large ones.—ALLISON.

The structures should be carefully moulded into shape, the ends of severed tendons and nerve trunks approximated with catgut. Superficial stitches, if taken, should be longitudinal. Iodoform should be dusted on, unsparingly, for its protective and anæsthetic properties, if not as an antiseptic, and an iodoform gauze applied.

The dressing should be left intact from four to six days, and another similar dressing applied.

Subcutaneous Foreign Bodies.—If superficial, and the skin movable, as in the case of a broken needle, it can be grasped by the thumb and fingers and the point pushed through the skin. This plan should also be followed in the case of any barbed object, as a fish hook or wheat beard.

Foreign bodies in the hand or foot, however, are harder to locate, but when a search is indicated, cocaine and an Esmarch hæmostatic bandage should be used.

Sterilized instruments should be used and the search made under antiseptic precautions; after thorough cleansing, a simple antiseptic dressing of iodoform gauze padded with corrosive sublimate cotton will suffice.

Ingrown Toe Nail.—After the field has been made surgically clean, an elastic ligature applied around the base of the toe and 20 M. of 4 per cent. solution of cocaine injected, the following procedure of Dr. Cotting can be adopted:

A narrow-bladed, sharp-pointed bistoury is made to cut its way backward alongside the nail as far as the matrix extends, exposing the entire side of the nail. Hemorrhage is stopped by pressure or by hot mercuric solution, 1-2000, iodoform and a gauze roller applied; the primary dressing being left on from six to ten days, when another dressing is applied.

Wounds of the Face.—If a lipoma, sebaceous cyst, or wart is to be removed, it is well to follow the routine practice of washing the skin with sublimate solution, 1-5000, and finally sponge the parts with ether or alcohol.

In the case of a wart it is a good plan to make the beginning of the cut on one side, with the edge of the knife directed away from the growth, so that this valve-like process of the skin will aid in gaining exact approximation, and thus lessen the chances of a scar.

The co-apting suture of fine No. 0 catgut should be introduced before the growth is removed in order to facilitate the rapid closing of the wound.

The following dressing should be used: Dust the wound with iodoform, overlay this with a thin layer of borated cotton, and apply iodoform collodion with a camel's hair brush. Several additional layers of cotton may be incorporated with the collodion.

DAVIS' CATGUT PLATES,

Oval and Horseshoe, for Anastomosis and other Procedures.

Dr. John D. S. Davis, Birmingham, Ala.

In a paper read before the Southern Surgical and Gynæcological Association, a system of plates to be used in anastomosis and pathological conditions of the intestinal canal (as in gangrene, gunshot wounds, multiple strictures, etc.) is described as follows:

The catgut plates are made for me by Messrs. Johnson & Johnson, New York City. The uncut green gut tissue is made into compressed plates and dried. From this large plate, the perforated oval approximation plates are made. The small perforations for the coaptation sutures are made by piercing the plates at

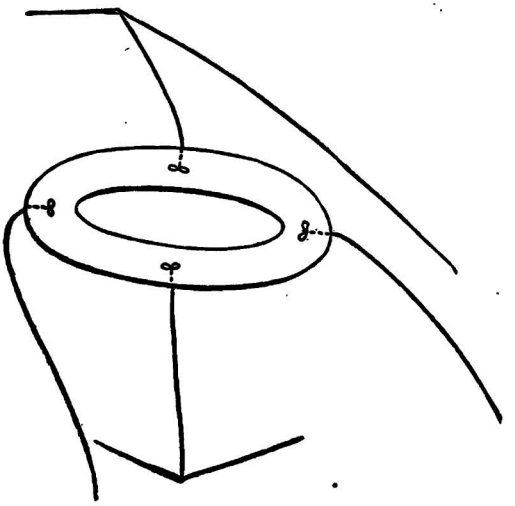


Fig. 14.

Approximation Catgut Plate, showing Knots for Holding Coaptation Threads.

four points with an awl. The coaptation threads are passed by means of a needle and secured by doubling the end of the thread and making an ordinary knot in it. (See Fig. 14.)

When the threads are properly fixed, they cannot be drawn through the holes. When the plates are absorbed away, the threads are simply drawn out by the last and most resisting plate, and carried away with it.

The plates are oval, with an oval opening greater than the transverse diameter of the plates. It is an easy matter to apply the plates through an incision equal in size to the oval openings in plates. (See Fig. 15.)

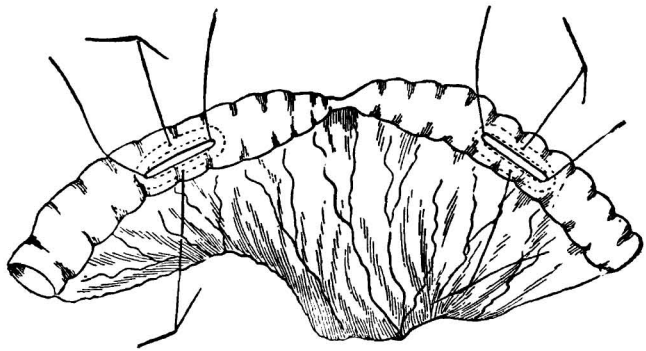


Fig. 15.

Catgut Plates applied to Ileo-ileostomy, without division, before tying together. Dotted lines represent size of plates.

Having tried all kinds of material for making the apposition plates, mats and rings, I have settled on catgut plates as the most suitable. Catgut plates are more easy than any other device yet introduced, to approximate the serous surfaces of the bowel in anastomosis, and some other operative procedures for restoring the bowel to its structural integrity.

Messrs. Johnson & Johnson keep on hand three different sizes of the plates, ready threaded, and furnish with each pair four Hagedorn straight self-threading needles. The largest size is used for gastro-enterostomy, the second for intestinal anastomosis, and the smallest for operations on children.

In gunshot wounds of large openings on the convex or lateral sides of the intestine (see Fig. 16), the integrity of the bowel may be

restored by cutting one end out of each of the plates, so as to convert them into *horseshoe plates* (see Figs. 17 and 18), and the wound closed in the following manner:

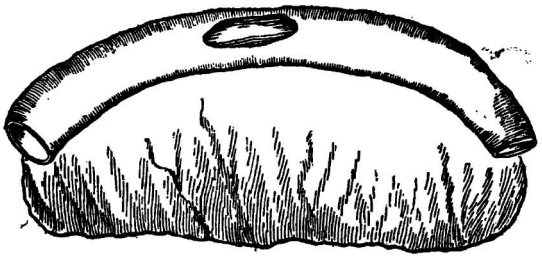


Fig. 16.
Gunshot Wound of the Convexity of Ileum.

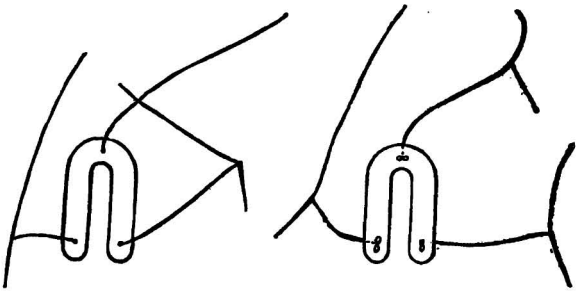


Fig. 17. Fig. 18.
Horseshoe Plates showing approximation threads armed with needles.

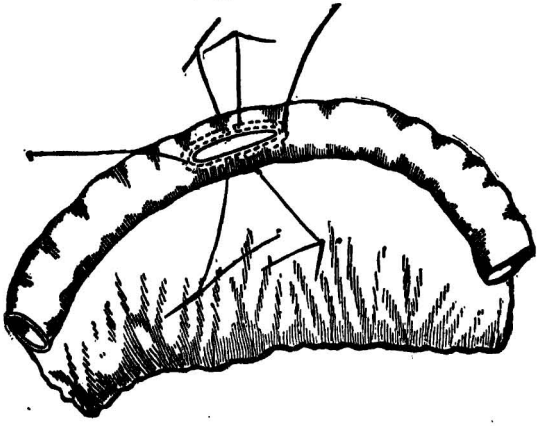


Fig. 19.
Horseshoe Plates in position before tying together. Dotted lines represent plates.

The edges of the wound may or may not be trimmed; each of the approximation plates having been deprived of one of its coaptation threads and converted into a horseshoe, are now introduced into the wound; the coaptation sutures, armed with needles, are

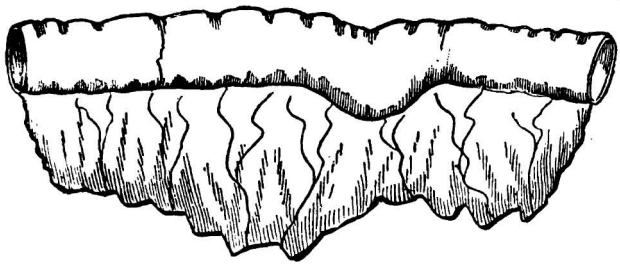


Fig. 20.

Result of the application of Horseshoe Plates.

made to transfix the angles and margins of the wound in such a manner as to give the plates the hinge appearance before closing. (See Fig. 19). The threads are tied, cut short, and pushed in, which completes the operation.

The serous surfaces should be denuded* before closing the plates and tying the threads. The operation, instead of infringing on the lumen of the gut, increases its calibre at the point of injury.

Apply outside safety sutures. They add to the security of the coaptation.

Operative Technique.

Like all other intro-abdominal operations, an anastomosis for any condition should be done under strict antiseptic precautions. The temperature of the operating room should be 80 or 85 F.

Incision.—In all operations above the ileo-coecal region, the incision should be made in the median line. Operations in the ileo-coecal region should be made from an incision extending from a little above the middle of Poupart's ligament to a point midway between the anterior superior spinous process of the ileum and the

*The denuding of the serous surfaces hastens the union of the approximation layers of the peritoneum, and the process produces less hemorrhage and quicker union than scarification. The primary glueing together of the approximated surfaces taking place sooner than in scarification, thereby giving early additional security.—A. H. CORDIER.

It seemed strange to me, during my work in this line, that someone had not previously thought of so very simple a thing as scraping the peritoneum with a knife, *as described by J. D. S. Davis*, to hasten plastic exudate.—ROBERT H. M. DAWBARN.

umbilicus. Hæmorrhage is controlled by hæmostatic forceps, which are used to twist the vessels instead of tying them. Fœcal extravasation can be prevented, in the absence of reliable assistance, by perforating the mesentery near the bowel with forceps carrying with them a narrow aseptic cloth strip or rubber band, which may be tied with sufficient firmness to prevent the escape of intestinal contents. In this way the bowel is to be constricted above and below the seat of operation. After division of bowel by excision of cæcum, or resection of intestine, both ends are closed by invaginating the ends of the bowel by means of a catchforceps applied to the opened bowel at the mesenteric side, and plunged into the lumen of the bowel to the extent of an inch, and the end closed by a continuous suture. In making an anastomosis in the ileum after division, the ends of the bowel may lie in opposite or same direction. After resection of the cæcum, the closed ends of the ileum and colon should be made to lie side by side, with ends in the same direction. In an anastomosis with division, the openings for the plates should be several inches above and below the part to be excluded from fœcal circulation.

SUTURES, LIGATURES AND KNOTS.

BY

JNO. B. DEAVER, M. D., PHILADELPHIA,

Ass't Prof. Applied Anatomy, University of Penn., Prof. Surgery Philadelphia Polyclinic, Surgeon to the German, Philadelphia, St. Agnes, and St. Mary Hospitals.

Ligatures and sutures constitute an important part of the surgeon's paraphernalia, and call for mechanical skill to apply them successfully and neatly, as well as a knowledge of the important sutures; this is also true of the knots securing the former in the tying of pedicles, etc.

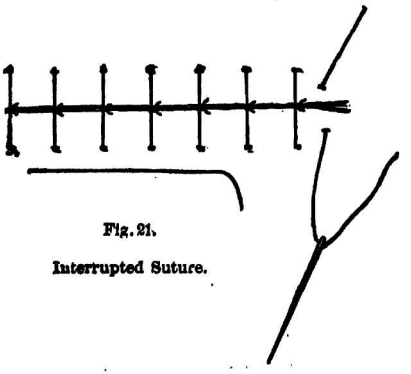


Fig. 21.

Interrupted Suture.

The most important of the great variety of sutures are the interrupted, continuous (simple), interrupted Lembert, continuous Lembert, the Zerney, and the tendon suture, which latter

might also be correctly styled the nerve suture. The important knots are the surgeons' or reef, the Staffordshire, the interlacing or triple interlocking knot, and the clove hitch.

The interrupted suture (Fig. 21) is made by transfixing either edge of the wound on the same line, approximating the edges and tying.

The continuous suture (Fig. 22) is made in the following manner: An ordinary surgical needle, armed with a long single thread, is passed through the edges of the wound, from side to side, and tied to prevent slipping, when the thread is carried obliquely across the wound, introduced and again passed through, this being repeated until the entire wound is closed; the first and last stitches resemble the interrupted suture, the last differing from the first only in that the thread is carried through double and tied to the single free end.

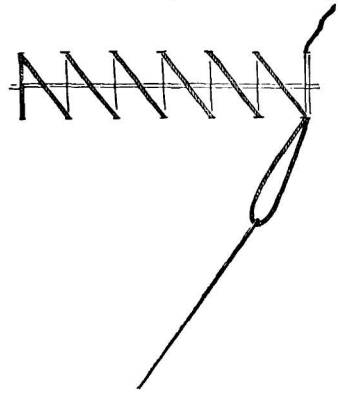


Fig. 22.
Continuous Sutures.

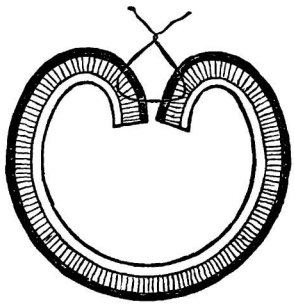


Fig. 23.
Lembert Interrupted Suture.

The interrupted Lembert suture (Fig. 23) is made, preferably, with an ordinary sewing machine needle, by transfixing the peritoneal and muscular coats of the intestine on either side and a short distance from the wound. Upon tying the sutures it causes the edges of the wound to roll inwards, so that the peritoneal coats are in apposition.

The Continuous Lembert Suture (Fig. 24) is made by first passing an interrupted Lembert, after which the thread is carried obliquely across the wound and passed through the serous and muscular coats only; this is repeated till the entire wound is closed, the last stitch being made in the same manner as is the corresponding one in passing the simple continuous suture. When this suture is completed, the serous surfaces of the intestine are apposed.

The Zerney Suture (Fig. 25) consists of two rows, a deeper passing through all of the coats of the bowel (being ordinary interrupted sutures) and tied in the wound, and a superficial, being a series of interrupted Lembert sutures.

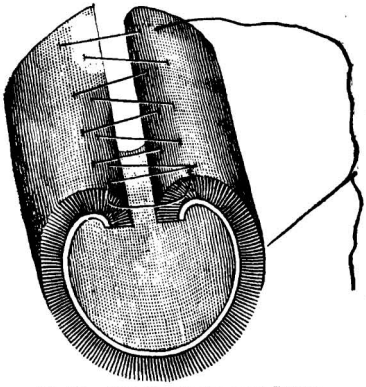


Fig. 24.—Continuous Lembert Suture.

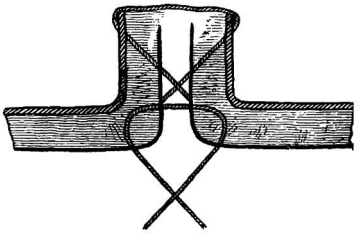


Fig. 25.—Zerney Intestinal Suture.

The Tendon (Figs. 26 and 27) is the interrupted, passed laterally, when the ends of the tendon or tendons are brought in direct apposition, and from above downwards when they are made to overlap, in either case passed through the entire thickness of the tendon.

To Tie the Surgeons' or Reef Knot (Fig. 28), pass the same end over the other in both turns; thus the thread held in the right hand is passed and turned over that held in the left; on returning the one now held in the left hand, the movements are reversed. The tendency to use the same movements in making both turns is a frequent cause for granny knots.

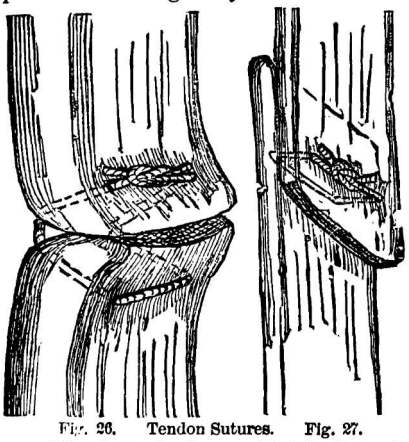


Fig. 26. Tendon Sutures. Fig. 27.

The Staffordshire Knot (Fig. 29), used in the tying of pedicles of growths, is made by introducing the pedicle needle, armed with a double ligature, through the pedicle, then withdrawing the needle, leaving the loop on one side and the two free ends on the other; the loop is brought over the growth, one of the free ends passed, above, the other remaining below; the ends are tightened evenly, and the ligatures finished with a surgeons' knot.

The Interlacing or Triple Interlocking Knot (Fig. 30) used especially in the tying of growths and broad pedicles, where the Staffordshire knot is deemed insufficient, is made in the following

manner: The pedicle needle armed with a long double ligature is passed through the pedicle at a point about one third of the distance

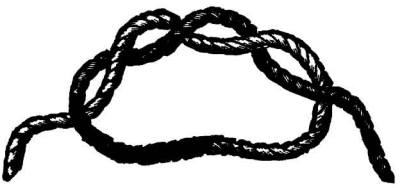


Fig. 28. Surgeons' Knot.

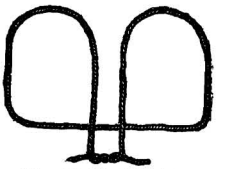


Fig. 29. Staffordshire.

from either margin, the loop thrown over a finger, and the needle withdrawn threaded; it is reintroduced at a point midway between the first puncture and the other margin and the second loop thrown over

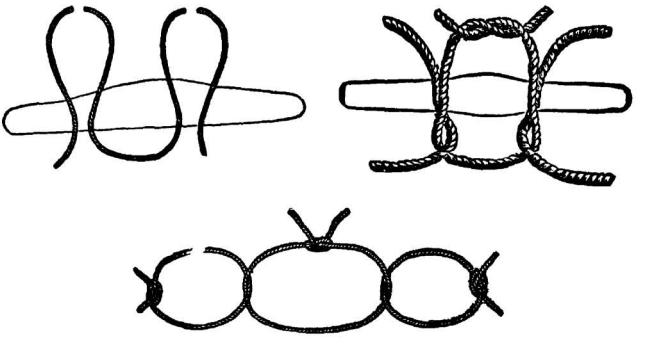


Fig. 30. Interlacing or Triple Interlocking Knot.

another finger; the needle is then withdrawn and thrown aside, thus leaving two loops on one side and one loop and two free ends on the other. The two ends are passed through the loop on the corresponding side. The two loops on the other side are now divided, making two middle and two lateral ligatures, when the knot is completed by tying the ends of the middle ligatures and the two laterals, the free ends of which are on opposite sides of the pedicle.

Fig. 31. Clove Hitch.

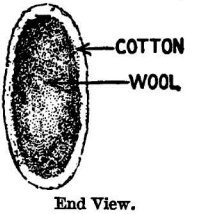
The Clove Hitch (Fig. 31) is made by taking a double half hitch over any object. It is used to retain a catheter in the bladder, also to secure a purchase on a limb in reducing a dislocation.

JOHNSONS' WOOL TAMPONS.

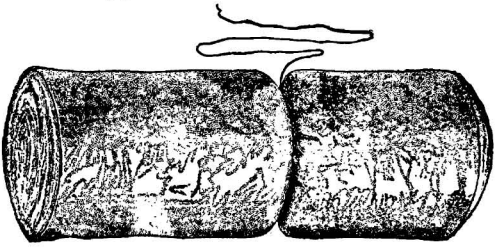
IN ROLLS.

Covered with Felted Absorbent Cotton.

Johnsons' Wool Tampons are made of thoroughly cleansed and sterilized lambs' wool rolled in tampons and covered with a thin layer of felted absorbent cotton. Size, about 14 inches by 1 inch. Can be cut to any desired length and fashioned into a tampon or pessary of almost any kind. They are elastic, and firm enough to afford requisite support and not lose their place. They can be saturated with any medication desired, and thus be made to absorb and disinfect vaginal secretions. They will keep clean and sweet longer than any other form of tampons or similar appliance.

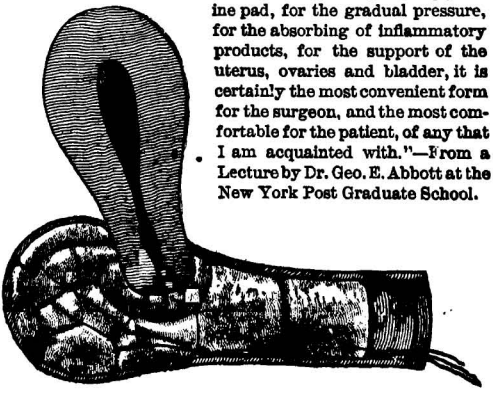


End View.



Straight Tampon.

"Johnsons' Wool Tampon fulfills a large percentage of the needs of the gynæcologist. For separating inflamed surfaces of an acute vaginitis, for the usual buttressing of the glycerine pad, for the gradual pressure, for the absorbing of inflammatory products, for the support of the uterus, ovaries and bladder, it is certainly the most convenient form for the surgeon, and the most comfortable for the patient, of any that I am acquainted with."—From a Lecture by Dr. Geo. E. Abbott at the New York Post Graduate School.

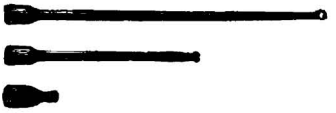


BOROGLYCERIDE AND WOOL TAMPONS.

By Dr. W. THORNTON PARKER.

Boroglyceride is, in my opinion, the best remedy we possess for the treatment of vaginal diseases, and indeed for use in gynæcological practice in general.

A most convenient form of Boroglyceride is that made by Messrs. Johnson & Johnson, of New York, who have given special attention to this matter and have prepared for the profession Gelatole Emulsions in collapsible tubes, with nozzles



of various sizes and shapes, specially adapted for the application of medicaments to interior surfaces—urethra, vagina, eye, ear, etc. These Emulsions are emollient, unirritating, and of the consistency of cream, are softened by the heat of the body, but will not run, and are soluble in water. And especially to be recommended is the non-poisonous, powerful antiseptic Boroglyceride in this form.

In the treatment of Vaginitis, I recommend an injection of hot water, 110° F., or hotter, as the case may require; the long nozzle of the collapsible Boroglyceride Emulsion holder should be inserted, and sufficient of the Emulsion pressed out to lubricate the walls of the vagina as thoroughly as possible. This should, of course, be done in the recumbent position in bed, and afterwards a napkin adjusted to protect the clothing.

This Boroglyceride Emulsion will be found of great benefit for use after the menstrual period in women, merely as a disinfectant and cleanser, even for those who are comparatively healthy.

It is useful after labor as an antiseptic; absorbent cotton saturated with it will make an excellent antiseptic pad in the puerperal state.

In the treatment of ulcerated uteri, and in the various forms of cervical and other diseases of the womb, the daily use of the Emulsion, after the hot water injections, is highly to be recommended.

For patients who cannot use injections while journeying, and who are suffering from diseases of the womb or bladder, the collapsible tube with its peculiar nozzle is very useful.

For the treatment of the various malpositions of the uterus and for other uterine diseases, and for general use where a tampon is indicated, Messrs. Johnson & Johnson have manufactured tampons of sterilized lambs' wool, covered with absorbent cotton, which, in my opinion, are superior to any at present obtainable.

These tampons are about one inch in diameter and fourteen inches long; by cutting off four or five inches, as required, a superior ring pessary can readily be fashioned, making the pessary large or small. These pessaries can be easily introduced through the speculum. When a large pessary is indicated, a double ring can be formed. They should be charged with Boroglyceride Emulsions.

Tamponite.

(COMBINED WOOL AND COTTON.)

An elastic, absorbent floss for gynæcologists, surgeons and dentists' use. It is well adapted to cases where an elastic absorbent is required for cushions, tampons, pessaries, compresses, padding splints, covering suppurating wounds, and similar purposes. This may be used plain, or charged with any required antiseptic.

Sanitary Burials.

The proper care and handling of the bodies of persons dying from infectious and contagious diseases is a subject that, for a considerable time, has engaged the serious attention of sanitary scientists, which has led to the adaptation to undertaking of the antiseptic methods that have proven so successful in preventing putrefaction in surgery.

Under the direction of Dr. Benjamin Lee, secretary and executive officer of the State Board of Health of Pennsylvania, Johnson & Johnson have prepared a thin blanket, made of absorbent cotton and gauze, charged with a solution of bichloride of mercury, chloride of zinc and other antiseptics and kept moist, to be used for wrapping the bodies of persons dying from communicable diseases.

Dr. Lee's Antiseptic Blanket.

For Wrapping the Bodies of Persons Dying from Communicable Diseases.

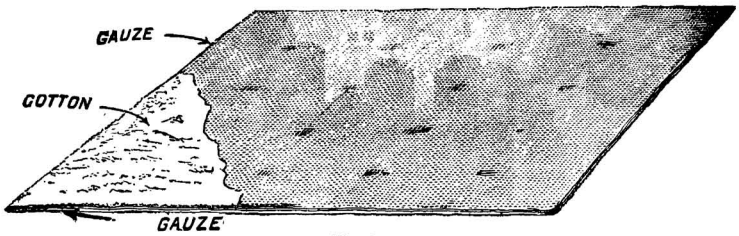


Fig. 37.

This blanket is so made as to perfectly fulfill the requirements of sanitary undertaking and to comply with the laws enacted in various States. It obviates the necessity of embalming, or hermetically sealed caskets, its antiseptic action being kept up continuously without re-moistening. Discharges, emanations, odors from bodies, are absorbed and instantly disinfected, and the handling of bodies rendered clean and safe.

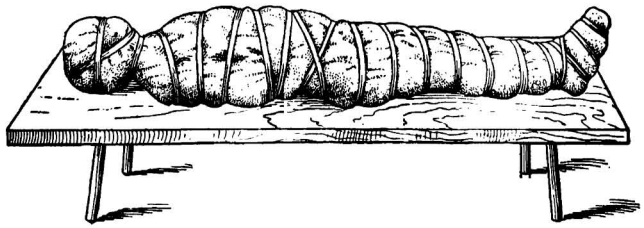


Fig. 38.
Method of wrapping dead bodies in Dr. Lee's Antiseptic Blanket as practised by William J. McDede, funeral director, New Brunswick, N. J.

The use of such a blanket also obviates the necessity for an ice box (a source of contagion), and completely envelops the body in air-tight covering, through which discharges cannot escape without being disinfected. Such an envelope is not only useful in communicable diseases, but in any case, as a safeguard in handling dead bodies. In places where ice or embalming is not practicable, or in exhuming bodies, the blanket is indispensable.

"An ice box should never be used for a body dead of infectious disease."

"The hair should never be preserved."

"All disinterred bodies, dead from any disease or cause, should be treated as dangerous to public health, and handled as infectious cases."

COMMUNICABLE DISEASES.
(*Contagious or Infectious.*)

Scarlet Fever, Diphtheria, Diphtheretic Sore Throat, Varioloid, Typhus Fever, Cholera, Dysentery, Erysipelas, Yellow Fever, Scarletina, Membraneous Croup, Small Pox, Typhoid Fever, Anthrax, Leprosy, Puerperal Fever, Whooping Cough, Measles.

Instructions Pennsylvania Board of Health.

How Dr. Lee's Blanket is Used.—In cases of death resulting from scarlet fever (scarlatina), diphtheria, cholera, dysentery, anthrax, erysipelas, membraneous croup, diphtheritic sore throat, small pox, varioloid, typhus fever, yellow fever or measles, this blanket should always be used. The body should be handled as little as possible. No more washing should be done than is demanded by the slightest requirements of decency. The water for this purpose should contain a disinfectant. One made by dissolving mercury tablets in water (see page 37) is most convenient. Embalmment is not necessary where the blanket is used. If there is much discharge, a piece cut from the blanket may be used to lay over the point of discharge. The body should then at once be completely wrapped in the blanket, care being taken that every point is covered. It may then be secured with safety pins, or preferably, with spirally wound tapes, as shown in the cut. It may then be handled with safety, and transported in any kind of a box or coffin. The only requirement is that the body should be completely wrapped, and kept so. The blanket overcomes the objection to a wet sheet, loose cotton wrappings, as often practiced and required in some health ordinances. It is made with outside covering of silk, plush, satin, or velvet, when desired. The plain blanket is, however, neat, wholesome and safe.

The price of the blanket is $2.50. It can be supplied by the leading casket companies.

BENJAMIN LEE, M. D., SECRETARY, PHILADELPHIA.

Commonwealth of Pennsylvania,

State Board of Health,

EXECUTIVE OFFICE,

Philadelphia, May 27, 1891

Messrs Johnson & Johnson,
New Brunswick,
New Jersey

Sir I am instructed by the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania, to transmit to you a copy of the enclosed Resolution adopted at its Regular meeting held at Altoona, Pa, May 14. 1891

Very respectfully,

Benjamin Lee

Secretary and Executive Officer.

Resolved: That this Board approves of and recommends the antiseptic blanket for the bodies of those who have died of contagious diseases prepared by the Secretary (Dr Benj Lee and manufactured by Johnson & Johnson) as a substitute for the sheet soaked in Corrosive Sublimate Solution heretofore required by the Board.

Fac-simile of Resolution.

BANDAGES.

Bandages—Adhesive.

½ inch x 5 yards	roll,	$ .20
1 inch x 5 yards	roll,	.25
2 inches x 5 yards	roll,	40
3 inches x 5 yards	roll,	.60

Bandages—Cotton.

1½, 2, 2½, 3, 3½, 4 inches wide	lb.,	.75
Assorted 1½ inches to 4 inches	lb.,	.75

Bandages—Crinoline.

1½ inches x 5 yards	dozen,	.75
2 inches x 5 yards	dozen,	.85
2½ inches x 5 yards	dozen,	1.00
3 inches x 5 yards	dozen,	1.15

***Bandages—Gauze*—(Bichloride or Carbolated.)**

2 inches x 10 yards	dozen,	1.25
3 inches x 10 yards	dozen,	1.50
4 inches x 10 yards	dozen,	1.75

Bandages— Gauze — Iodoform — 10 per cent.

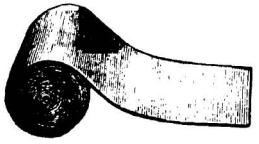
2 inches x 10 yards	dozen,	2.50
3 inches x 10 yards	dozen,	3.00
4 inches x 10 yards	dozen,	3.75

Bandages—Gauze—Plain.

2 inches x 10 yards	dozen,	.80
3 inches x 10 yards	dozen,	.90
4 inches x 10 yards	dozen,	1.10

Bandages—Linen.

1½, 2, 2½, 3, 3½, 4 inches wide	lb.,	1.75
Assorted, 1½ inches to 4 inches	lb.,	1.75
Linen finish, assorted	lb.,	1.00



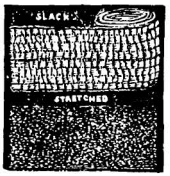
Bandages—Martin's.

2 inches x 3 yards	roll,	.60
2 inches x 4 yards	roll,	.85
2 inches x 5 yards	roll,	1.00
2½ inches x 3 yards	roll,	.65
2½ inches x 4 yards.	roll,	1.00
2½ inches x 5 yards	roll,	1.25
3 inches x 3 yards	roll,	.90
3 inches x 4 yards	roll,	1.00
3 inches x 5 yards	roll,	1.35

Bandages—Plaster Paris.

1½ inches x 5 yards	dozen,	1.50
2 inches x 5 yards	dozen,	1.60
2½ inches x 5 yards	dozen,	1.70
3 inches x 5 yards	dozen,	1.85
3½ inches x 5 yards	dozen,	2.00
4 inches x 5 yards	dozen,	2.25

Linton Woven Elastic Bandage. Superior to Elastic Stockings for Varicose Veins.



A porous, absorbent, elastic bandage, which follows a swelling up or down, as the case may be. May be put at any required tension and fastened by simply tucking the end under the last fold, which insures its permanent stay until removal for purpose of cleanliness. Its porosity is such that it never causes itching, rash or ulceration under the bandage, and it is the only bandage which is superior to elastic stockings for varicose veins.

Bandages—Woven Elastic.

2 inches x 3 yards	each,	.50
2½ inches x 3 yards	each,	.60
3 inches x 3 yards	each,	.70
2 inches x 5 yards	each,	.70
2½ inches x 5 yards	each,	.80
3 inches x 5 yards	each,	.90

BOROGLYCERIDE.

In pound bottles 2.00

COTTONS.

Our plain absorbent cotton is rolled in even sheets of just the right thickness and interlaid with tissue paper to prevent felting. It is as easily applicable as an ordinary cloth bandage.

Cotton—Absorbent.

½ ounce packages	lb.	.90
1 ounce packages	lb.	.65
2 ounce packages	lb.	.60
4 ounce packages	lb.	.55
8 ounce packages	lb.	.50
16 ounce packages	lb.	.45

Cotton—Borated, Carbolated, Corrosive Sublimate.

1 ounce packages	lb.	.80
2 ounce packages	lb.	.75
4 ounce packages	lb.	.70
8 ounce packages	lb.	.65
16 ounce packages	lb.	.65

Cotton—Iodized.

1 ounce bottles	per bottle,	.25

Cotton—Iodoform.

1 ounce bottles .....per bottle, $ .25
¼ pound can ..... lb. 2.25

Cotton—Salicylated.

1 ounce packages... .....lb. .95
2 ounce packages..... .....lb. .95
4 ounce p..kages... .....lb. .90
8 ounce packages ... .lb. .85
16 ounce packages.... ....lb. .80

Cotton—Styptic.

1 ounce bottles.....per bottle, .25

Cotton—Wool.

——... ....lb. .40

COTTONOID

Is prepared particularly for dental surgery. It is made of absorbent cotton fibres felted in thin sheets (smooth on both sides). In dentistry it has taken the place of napkins, lint, cotton and Japanese paper. It has a higher absorbent power than any of these, is much cleaner, and is cheap enough to use once and throw away.

Put up in one pound boxes, cut in napkins 12x3½ inches. One pound will make 400 napkins 3¼x4 inches. Price, $1.00 per pound.

GAUZES.

Gauze—Carbolated, Borated, Corrosive Sublimate.

1 yard x 1 yard..... .....roll, .20
1 yard x 5 yards..... . .....roll, .75

Gauze—Cyanide Mercury and Zinc, Creolin, Tar.

5 yard cans..... ..... .75
1 yard cans .... .25

Gauze—Eucalyptol, Naphthaline, Thymol, Ox. Zinc.

1 yard x 1 yard..... .....yard, .25
1 yard x 5 yards.....roll, .80

Gauze—Iodoform.

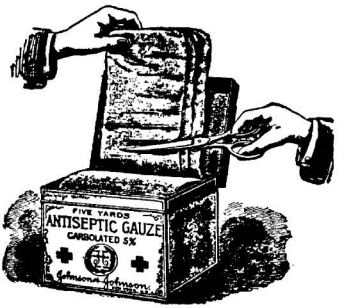
10 per cent. 1 yard x 1 yard..yard, .35
10 per cent. 1 yard x 5 yards...roll, 1.40
20 per cent. 1 yard x 1 yard..yard, .50
20 per cent. 1 yard x 5 yards...roll, 1.90
40 per cent. 1 yard x 1 yard..yard, .70
40 per cent. 1 yard x 5 yards...roll, 2.75

Gauze—Plain.

5 yards..... .....yard, .07
25 yards..... ...yard, .06½

Our Perfect Gauze Can.

Allows the gauze to be drawn from the can as required, without removing the roll. It also prevents drying and deterioration.



GAUZE IN GLASS.

(Air tight.)

5 yds.

1 yd.

We furnish, at a slight additional cost, all our antiseptic gauzes in aseptic air-tight glass containers. The gauze is so packed in these jars that a portion can be used without removing the whole.

No metallic or other contamination is possible.

GELATOLE EMULSIONS.

In Collapsible Tubes with Various Shaped Nozzles.

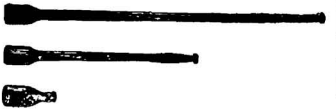
Formed of a non-irritating, emollient emulsion base (starch, gelatine, and a bland oil), combined with such drugs as may be necessary to apply to raw, inflamed or mucous surfaces, such as the eye, ear, nasal organs, etc., as well as for injection to the urethra, vagina, anus, uterus, etc. The tubes are furnished with variously shaped nozzles, which are interchangeable.

LIST OF GELATOLE EMULSIONS.

Boroglyceride	Per tube 20c.
Carbolized 1 per cent.	
Cocaine 2 per cent	
Glycerine 95 per cent	
Hydrastin 2 per cent	
Mercury Yellow Oxide 2 per cent	

Rubber Nozzles.

Applicable to all Emulsion tubes, each ..... .10



No. 2. Urethral; length 8 inches; flexible rubber ..... each, .10

No. 3. Uterine and vaginal; length 5 inches ..... each, .10

No. 4. Eye and ear ..... each, .05

GELATOLE OINTMENTS.

In Collapsible Tubes. Perfect Dressings for the Skin.

1. Both base and drug permeate into and through the outer layer of the skin.

2. The action of the drug is rendered continuous and capable of reaching deep seated affections.

3. The preparation, by its slight saponifying action, removes obstructions to the action of the medicament; and by its detersive action displaces the fat of the skin until it becomes permeable and loses its capability of resisting absorption.

5. These ointments are not greasy or sticky, but form a clean protective film over the skin, so that they can be applied on any part of the body.

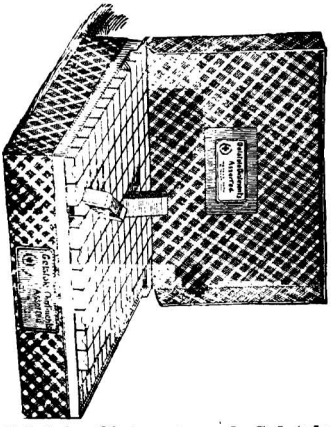
6. As they will not smear or run, the action of the medicament is confined to the surface to which it is applied.

They are put up in collapsible tubes which perfectly preserves the ointment and makes a receptacle which is convenient to use by physician or patient.

OINTMENTS—GELATOLE.

Ointments in Collapsible Tubes.

Acid Boracic, Br. P	Per tube 20c.
Acid Carbolic, U. S. P.	
Acid Salicylic, 20 per cent.	
Chrysarobin, U. S. P	
Hydrastin, 5 per cent	
Iodine, U. S. P	
Iodine Comp	
Iodoform, U. S. P	
Lead Oxide, U. S. P.	
Menthol	
Mercury Metallic, U. S. P	
Resorcin, 5 per cent	
Sulphur, U. S. P	
Zinc Oxide, U. S. P	

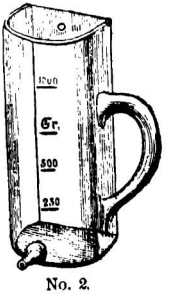


Gelatole Ointments and Gelatole Emulsions.

For convenience in dispensing and keeping stock clean and in order. Are put up in substantial cases, arranged to hold 6 dozen or 12 dozen, assorted as desired.

GLASS IRRIGATORS.

No. 1.

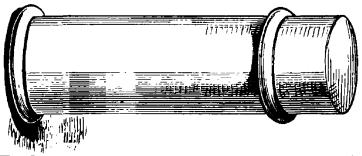


No. 2.

No. 3.

No. 1. Capacity, 2 quarts. .. each, $1.75
No. 2. Capacity, 2 quarts. .. each, 1.75
No. 3. Capacity, 1 quart .. ..each, 1.25

IODOFORM SPRINKLERS.



Hard Rubber.....each, 1.25
Hard Wood .....each, 50

JUTE.

Jute—Corrosive Sublimate.

1 pound packages.....lb. .28

Jute—Plain.

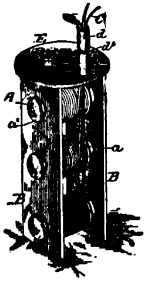
1 pound packages .....lb. .25
50 pound bales.....lb. .18
100 pound bales .....lb. .15

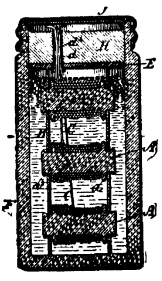
Jute—Tarred.

1 pound packages.....lb. .40
25 pounds in tin lined cases...lb. .30
50 pound bales .....lb. .25

PREPARED LIGATURES.

We illustrate herewith a bottle containing three sizes of ligatures—either catgut or silk—either one of which may be withdrawn from the bottle without removing the stopper. In this package the spools are of glass, the socket of hard rubber, and the cork formed of antiseptic gelatole, so that the whole package is tight, non-corrosive, and perfectly preserves the ligature.





Prepared Ligatures—Catgut,

3 spools in bottle.

Carbolized 5 per cent.....each, $ .60
Chromicized.....each, .60
Corrosive Sublimate, 1-2,000..each, .60
Oil Juniper .....each, .60
Hospital size .....each, 1.25

Prepared Ligatures—Silk.

3 spools in bottle.

Carbolized 5 per cent.....each, .50
Corrosive Sublimate 1-2,000...each, .50
Oil Juniper.....each, .50
Hospital size .....each, 1.00

Plain Ligatures—Catgut.

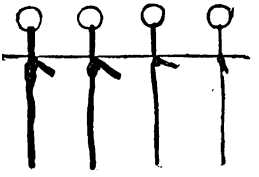
In bundles of 12 strings each.

Assorted sizes .....per bundle, 1.10

Plain Ligatures—Silk.

Silk twisted in skeins.....oz. 1.75
Silk twisted on cards.....dozen, .90
Silk twisted in slide cases...dozen, 1.25
Silk braided on cards.....dozen, 1.60
Silk braided in slide cases...dozen, 2.25
Silk braided in skeins.....oz. 3.50

No. 4. No. 3. No. 2. No. 1.



Cut illustrating the 4 sizes of catgut and silk ligatures.

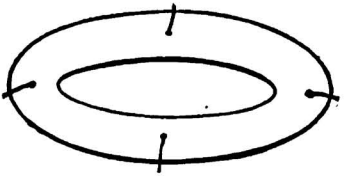
SILK WORM GUT.

Per bundle..... long, 1.10
Per bundle .....short, .85

SILVER WIRE.

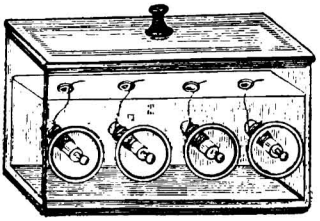
Assorted sizes . . . . . per coil, $ .35

CATGUT PLATES (Dr. Davis).

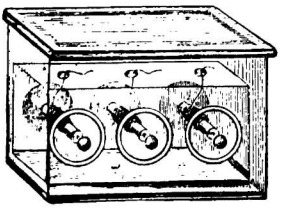


In pairs. Sterilized and in Antiseptic solution, with coaptation threads. Per pair..... .....1.00

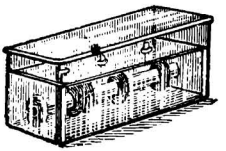
Hagadorn's All Glass Ligature Holders.



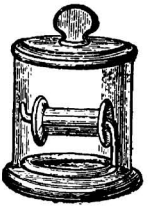
No. 1. 4 spools, double case....each, 8.00



No. 2. 3 spools, double case....each, 7.00



No. 3. 3 spools, single case.....each, $3.00



No. 4. 1 spool .... each, 1.25

LINT.

Lint—Perfect Absorbent.

1 ounce packages. ..... lb. .80
1 pound packages... .....lb. .70

"LINTINE."

A new absorbent fabric made of felted absorbent cotton in thin sheets. More absorbent than cotton or lint, a substitute for both for all purposes. Every fibre thoroughly cleansed and sterilized.

Advantages: 50 per cent. more surface than cotton or lint; tears evenly, cleanly and compact.

Lintine is readily shaped into bandages, pads, tampons, cushions, or any desired form of dressing. Can readily be formed into a pencil or mop for throat applications, small surfaces or cavities. Perfect for absorbing discharges and for drainage tubes. Makes cheap and excellent sanitary napkins, handkerchiefs for consumptives, or diaper cloth for children.

Lintine has a thousand more uses; is better than loose cotton or lint, and much cheaper.

1 pound packages... .....lb. .70
1 ounce packages. . .....lb. .80

MACKINTOSH CLOTH.

1 yard in box ....yard, 1.35
5 yards in box ....yard, 1.25

OIL MUSLIN AND SILK.

Oiled Muslin.

1 yard rolls, or boxes.....yard, .65
5 yard rolls, or boxes . .....yard, .55

Oiled Silk.

28 inches x 1 yd, in box or roll..yd, $ .85
28 inches x 5 yds, in box or roll.yd, .75
Extra heavy. .....yard, 1.10
Extra heavy, 5 yards..... yard, 1.00
Protective, carbolated .....yard, 1.35
Protective, carbolated, 5 yds.yard, 1.25

OAKUM.

Oakum—Specially Prepared.

1 pound packages .....lb. .20

Oakum—Carbolated.

1 pound packages.....lb. .30

Oakum—Corrosive Sublimate.

1 pound packages .....lb. .30

PAPOID.

1 ounce bottles .....oz. 3.00
Tablets, with Soda Bicarb, 100s..doz. 12.00
Tablets, bottle of 500 for dispensing. 4.50
Tablets, with Soda Bicarb, trial size .... doz. 4.00
Tablets, with Boracic Acid, 100s.doz. 12.00

PLASTERS.

Aconite.

Perforated or plain, yards....yard, .60

Aconite and Belladonna.

Perforated or plain, yards....yard, .60

Ammoniac and Mercury.

Plain, yards .....yard, .80

Belladonna.

Plain or perforated, 1 yard..yard, .65

Belladonna and Capsicum.

Plain or perforated, 1 yard...yard, .60

Belladonna and Opium.

7 inches x 1 yard.....yard, .85

Canthos.

An improved cantharidal plaster; blisters in about half the time required by any other vesicant. Its action is painless.

7 inches x 1 yard .....yard, 1.00

Bryonia.

Plain or perforated, yards....yard, .60

Capsicum.

Plain or perforated, 1 yard ...yard, .55

Galbanum or Hemlock.

Plain or perforated, yards.. .yard, .55

Iron.

Plain or perforated, yards....yard, .55

Lead.

Plain, 7 inches x 1 yard... ...yard, .55

Mercurial.

Plain or perforated, yards .. yard, .80

Opium.

Plain or perforated, yards....yard, $ .80

Pitch.

Plain or perforated, yards ...yard, .55

Poor Man's.

Plain or perforated, yards .. yard, .55

Spice.

Plain, 6 inches x 1 yard. .....yard, .35

Strengthening.

Plain or perforated, 7 inches x 1 yard..... .....yard, .55

Sumach.

Perforated and plain, yards..yard, .60

Thapsia.

French Formula, yards.. ...yard, .50

Toothache.

1 dozen in box.....dozen boxes, 1.75

Warming.

Plain or perforated, yards....yard, .55

MUSTARD PLASTERS.

On Cloth.

10 leaves..... ..... per box, .20
1 yard x 6 inches..... ....yard, .20

On Paper.

10 leaves ..... box, .20
1 yard x 6 inches.....yard, .20

SURGEONS' RUBBER ADHESIVE PLASTER.

On Mole Skin.

7 inches x 5 yards.....roll, 2.75
7 inches x 1 yard.....roll, .60

On Strong Cotton Cloth.

7 inches x 1 yard..... ...roll, .30
7 inches x 5 yards ....roll, 1.25
12 inches x 5 yards... .....roll, 1.50

On Twilled Linen.

7 inches x 1 yard.....roll, .60
7 inches x 5 yards.. ....roll, 2.75

On Spools, Plain or Perforated.

½ inch x 10 yards, plain only..each, .30
1 inch x 10 yards ... ...each, .35
1½ inches x 10 yards.. ... ...each, .40
2 inches x 10 yards.....each, .55
2½ inches x 10 yards.....each, .60
3 inches x 10 yards..... .....each, .70

WOOD'S ADHESIVE PLASTER.

Extra Strong.

12 inches x 5 yards. ..... roll, 2.25
7 inches x 1 yard..... .....roll, .60
½ inch spools 10 yards long...each, .40
1 " " " " " ..each, .50
2 " " " " " ..each, .90
3 " " " " " ..each, 1.10

SURGEONS' ISINGLASS PLASTER.

On Mole Skin.

7 inches x 1 yard. ....roll, $ .45

On Muslin.

8 inches x 1 yard..... roll, .30

On Silk.

White, flesh or black, yards. ..roll, .50

SPREAD POULTICES OR WATER DRESSINGS.

Among our products that have met with favor are prepared poultices of starch, flaxseed, slippery elm and Iceland moss. They are manufactured after the manner of prepared mustard plasters, and are made ready for use by dipping in water. They possess the same relative advantages over ordinary poultices as are offered by prepared mustard plasters over the ancient home-made mustard plaster. They will be found of great service as an emollient dressing for an inflamed skin, and in extreme cases of eczema, erysipelas, etc.

Poultices or Water Dressings.

Iceland Moss, 7 in. x 1 yd.....	each,	.35
Linseed, 7 in. x 1 yd	each,	.35
Slippery Elm, 7 in. x 1 yd.....	each,	.35
Starch. 7 in. x 1 yd...	each,	.35
Zinc Oxide, 7 in. x 1 yd.	each,	.35

RUBBER SHEETING.

36 inches x 1 yard.....	box,	.80
36 inches x 5 yards....	box,	3.50
45 inches x 1 yard...	box,	1.00
45 inches x 5 yards...	box,	4.75

SPONGES, BLEACHED AND STERILIZED.

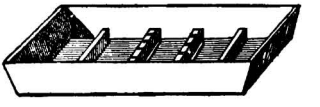
Unclean sponges are recognized by surgeons as a source of wound infection. Ordinary washing will not remove the adhering matter from the sponges of the market. Our sterilized aseptic sponges are prepared—1st, by beating and washing, to remove dirt, shells, etc ; they are then well steamed and washed, all vegetable and the organic matter destroyed, by oxidation, leaving only the tissue of the sponge itself; finally, they are sterilized by heat, dipped in antiseptic solution, placed in aseptic packages, ready for use.

12 in bottle..... ..per bottle, $ .85

PERFORATED SHOT.

Per dozen..... .... .25

PORCELAIN TRAYS FOR INSTRUMENTS.



12½ x 6¾ inches....	each,	5.00
14½ x 8 inches..... ..	each,	7.50

GLASS TRAYS.

9⅛ x 5½ inches....	each,	1.25
13½ x 7½ inches.....	each,	2.50
15 x 9½ inches....	each,	4.00
19½ x 12 inches..... . .	each,	8.00

ANTISEPTIC TABLETS.

Prepared so that 1 tablet to 1 pint of water equals solution 1 to 1000. By increasing or diminishing the amount of water, the strength of the solution may be altered at pleasure.

Corrosive Sub., 25 in bottle.....each, .25
Corrosive Sub., 50 in bottle.....each, .40
Corrosive Sub., 100 in bottle... each, .65

WOOL.

Antiseptic, lbs., ½ lbs., ¼ lbs.. ...lb. 2.00
Antiseptic, in ounce packages....oz. .20
Johnsons' Wool Tampons...per doz. 1.25

TAMPONITE.

Tamponite is a mixture of absorbent and sterilized lamb's wool, with purified and absorbent cotton three times as absorbent as wool. The wool is deprived of all foreign matters, and rendered soft and elastic. Twice as bulky as cotton, and will not pack in lumps.

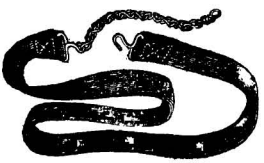
Tamponite, pounds.....lb. 1.35
Tamponite, ounces.....lb. 1.60

DRAINAGE TUBES.

Decalcified bone..... per bottle, .45
Purified rubber, 5 tubes in bottle.....per bottle, .50

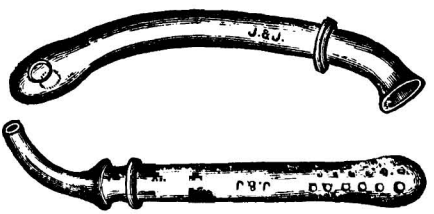
Plain rubber drains..... 25 to 35 cents per yard.

Glass Drains (Prof. Gross') Nos. 1 to 7.....per set of 7, 1.25



TOURNIQUET—ESMARCH'S.

Price, complete 1.25
Without chain..... ... .75



Tait's Glass Drainage Tubes ..... each, .50

IMPROVED BELLADONNA PLASTER.

(JOHNSON & JOHNSON).

Increased Action.—We have secured increased action in Belladonna Plaster. First, by the use of a standard extract made from roots of wild Belladonna, gathered uniformly in time and season in one locality—(other extracts contain widely varying amounts of atropia)—second, by combining with the base, boric acid, which frees the pores from clogging matter, thus promoting absorption of the incorporated drug.

Says Dr. Shoemaker, in a paper read before the Pennsylvania State Medical Society, June 28th, 1887:

"The addition of boracic acid in the proportion just named to belladonna has some action upon the fatty matter of the skin, and renders the effect of the former drug more decided."

DR. AGNEW'S REPORT.

Dr. D. H. Agnew, of Philadelphia, Professor of Surgery in the University of Pa., very kindly permits us to say that he is greatly pleased with Johnson & Johnson's Belladonna Plaster, with boracic acid; that it gives a quicker and better effect than any other Belladonna Plaster he has heretofore used.

CANTHOS, AN IMPROVED CANTHARIDAL PLASTER.

"Canthos" is essentially the U. S. P. Cantharides Plaster, the flies, however, are incorporated with a soft oleaginous base which holds the vesicating agents in solution and brings them more closely in contact with the skin.

The base has a poultice-like action, preparing the skin that the blister may readily act.

The vesication is prompt and certain.

Blisters in from two to four hours.

The vesicle is well defined, having no tendency to spread.

The vesication is painless.

With no danger of stranguary.