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Massachusetts General Hospital.

SURGICAL CASES.

Antiseptic Treatment.

SERVICES OF

DRS. BIGELOW, HODGES & BEACH.

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MASSACHUSETTS GENERAL HOSPITAL—SURGICAL  
CASES—ANTISEPTIC TREATMENT.

SERVICES OF DRs. BIGELOW, HODGES AND BEACH.

[*Reported by William D. Hodges, M. D.*]

A REPORT on antiseptic surgery, as practised in the east wing of the Massachusetts General Hospital, was written by me, and published in the *Boston Medical and Surgical Journal*, for July 14, 1881, with remarks by Dr. Beach, on the advantages possessed by what is known to the trade as phenyle, milk-oil, or sulpho-naphthol as an antiseptic agent over and above that of carbolic acid.

The essential points demonstrated in that report were :

1. The recognition of the poisonous properties of carbolic acid, when employed as an antiseptic agent.
2. That this liability could not be anticipated in any case; the first evidence of such a disaster being symptoms of poisoning, which might or might not be relieved by a change of the dressings.
3. The advantages claimed for the substitute of carbolic acid were: (*a.*) That it was non-poisonous, through absorption from dressings; (*b.*) That it was non-corrosive, either to instruments, to the hands of the operator employing the solution, or to the wound and vicinity where applied; and (*c.*) if compared with other antiseptic agents, would be found protective from septic processes.

Carbolic acid and other poisonous drugs, dangerous from the possibility of their absorption from surgical dressings, are almost universally employed as antiseptic agents at the present time. In view of this fact, attention is invited to the following quotation from the paper previously mentioned: "As the absorption of carbolic acid from surgical dressings cannot be anticipated in *any* given case, it becomes a serious question as to how far surgeons are justified in protecting wounds from septic processes, by subjecting patients to the possibility of a fatal result from poisoning."

A recent writer goes so far as to suggest prosecutions for malpractice, in cases where bad results follow the non-employment of antiseptic surgery. The same writer states: "The majority of germicides now in use pro-

duce injurious effects when introduced into the circulation in immoderate quantity. The danger of absorption depends, in a measure, upon the surface exposed as well as upon the length of the period of contact." The writer, on the one hand, demands a general employment of antiseptic surgery, and on the other hand, shows the possibility of the absorption of poisonous drugs when used in antiseptic dressings. As a consolation to the surgeon in cases where death is caused by the absorption of poison, he says, "the toxic influence of the drug resulting from its possible absorption should always be kept in view;" and, in referring to carbolic acid, as an antiseptic, says "It is astonishing that so few cases of poisoning have been reported as a result of its antiseptic use." It is only fair to add to the above, that when the poisonous symptoms have appeared, it may be too late to save the patient by a change of dressing or by any other treatment. Though it is astonishing that so few cases of carbolic acid poisoning from dressings have been reported, our astonishment should not allow us to make the unsafe inference that such cases have not occurred, but in keeping such a possibility "always in view," as the writer suggests, sound practice would reasonably lead one to adopt the safe agent, when it supplies a protection from septic processes equal to that of carbolic acid.

The following cases are published as a sequel to the previous report, in order to corroborate the facts then demonstrated, and to show the value of a thoroughly efficient and non-poisonous antiseptic, which can be easily obtained and employed by the surgeon.

These cases include all compound fractures and dislocations treated in the east wing of the hospital, from July, 1881, to the time of writing this paper. Patients whose injuries were of such a nature that they died within twenty-four hours after their admission, are not considered in this report.

Of the cases recorded, eighty-seven were males and thirteen females; average age 30.98 years.

The average length of time that each patient remained in the hospital was sixty six days.

#### INJURIES :

- 107 Compound fractures.
- 8 Compound dislocations.
- 13 Simple fractures.
- 3 Simple dislocations.

Number of Case.	Sex.	Age.	OCCUPATION.	NATURE OF INJURIES.	TREATMENT.	Number of Dressings.	Day, Dressings were Omitted.	TEMPERATURE.	Day of Discharge.	REMARKS.
1	F.	60	Housekeeper.	Colles fracture of left wrist; compound fracture of left radius and ulna, with extensive laceration.	Phenyle; splints.	12	70	7th day, 103°.	188	
2	M.	30	Railroad employé.	Compound fracture of left leg; simple fracture of pelvis into right acetabulum, with eversion of foot.	Phenyle.	5	46	4th day, 103°.	88	
3	M.	22	Operative.	Compound fracture of both legs; dislocation of right shoulder; laceration of scalp.	Dislocation reduced; left leg amputated at middle; phenyle; right leg, phenyle and splints.	17	52	4th day, 102.5°.	133	
4	M.	13	Minor.	Compound comminuted fracture of left leg, with great displacement.	Phenyle.	17	85			
5	M.	30	Machinist.	Compound comminuted fracture of carpal bones.	Phenyle.	8	99	Normal.	150	Union on 108th day.
6	M.	27	Railroad employé.	Compound comminuted fracture of humerus at the lower third.	Incisions; removal of fragments; phenyle; 14th day amputation.	6	30	2d and 16th days, 102.5°.	69	Patient was admitted three days after injury was received.
7	M.	50	Railroad employé.	Compound comminuted fracture of left leg and left tarsal bones.	Fragments removed, fractured ends sawed; carbolic drip for 48 days; 61st day carbolic Lister.	6	37	13th day, 103°; 88th day, 103.8°.	98	83d day, large, white sloughy patches on tonsils and pharynx; patient not isolated.
8	M.	23	Student.	Compound comminuted fracture at lower third of left leg.	Amputation of toes at second tarsal articulation; phenyle.	6	44	2d day, 102°.	70	
9	M.	15	Minor.	Compound fracture of left femur; fracture of right leg; great laceration.	Phenyle.	1	25	Normal.	125	Death on second day from exhaustion.
10	M.	20	Railroad employé.	Compound comminuted fracture of left foot; severe bruise of right foot.	Phenyle.	1	2	.....	2	
11	M.	8	Minor.	Compound fracture of left leg; dislocation of right shoulder.	Carbolic cotton batting; 3d day, carbolic poultice; 17th day, second and fourth toes removed; carbolic Lister.	6	25	3d day, 104.5°; 5th day, 102°; 7th day, 105°.	93	3d day, a bluish-like scarlet fever, with tender inguinal glands; 5th day, rash gone; 7th day, redness and tenderness along course of vessels in left thigh.
12	M.	27	Waiter.	Compound fracture at middle of right leg. Potts fracture of left leg.	Dislocation reduced; phenyle.	3	27	Normal.	52	
13	M.	67	Policeman.	Compound fracture of left femur.	Phenyle.	3	11	Normal.	52	
14	M.	28	Railroad employé.	Compound fracture right radius and ulna; great laceration.	Phenyle.	2	23	Normal.	150	Union 45th day; great œdema.
15	M.	23	Farmer.	Compound comminuted fracture of lower third of right femur.	Phenyle.	4	19	1st day, 102.8°; 7th day, 103°.	70	
16	F.	40	Wife	Compound comminuted fracture at lower third of right leg.	Carbolic.	7	47	Varied between 99° and 105°.	52	6th day, knee joint laid open; 47th day, carbolic poisoning and secondary hemorrhage; femoral tied at Hunter's canal; 49th day, gangrene; 52d day, death.
17	M.	25	Clerk.	Compound fracture of lower third of left leg.	Portion of the shaft of the tibia—two inches removed—phenyle.	18	108	Normal.	138	Large abscess opened on 11th day; small fragments removed till the 100th day; good union on the 88th day.
18	F.	67	Wife.	Compound fracture of internal condyle of humerus into the elbow joint; severe bruise of head.	Phenyle till 40th day; then charpie and phenyle.	11	40	Normal.	46	30th and 40th day, free incisions, much pus and bleeding; 46th day, secondary hemorrhage and death.
19	M.	28	Railroad employé.	Compound comminuted fracture of radius and ulna at upper third; great laceration and hemorrhage.	Phenyle.	7	52	38th day, 102°.	75	38th day, diarrhœa and vomiting caused by fruit given by a visitor.
20	M.	21	Carpenter.	Compound fracture of lower third of right leg.	Phenyle.	12	85	Normal.	100	49th day, two large pieces of radius removed.
21	F.	42	Wife.	Compound dislocation of the astragalus; fracture of the os calcis.	Astragalus removed; phenyle.	4	45	Normal.	102	Union, 63d day.
22	M.	8	Minor.	Compound fracture of the metatarsal bones.	Phenyle.	2	50	Normal.	86	
23	M.	30	Laborer.	Compound fracture at middle of left leg.	Phenyle.	6	29	Normal.	75	
24	M.	28	Boxmaker.	Compound fracture at lower third of left leg.	Phenyle.	19	63	8th day, 103.5°.	176	
25	M.	24	Railroad employé.	Compound fracture of first phalanx of thumb.	Phenyle.	2	20	Normal.	39	Discharged, with plaster bandage.

Number of Case.	Sex.	Age.	OCCUPATION.	NATURE OF INJURIES.	TREATMENT.	Number of Dressings.	Day Dressings were Omitted.	TEMPERATURE.	Day of Discharge.	REMARKS.
26	M.	27	Laborer.	Simple fracture of right ribs; compound fracture of upper third of right leg; severe contusions; vomiting.	Swathe for ribs; phenyle.	1	12	Normal.	43	Plaster bandage on 40th day.
27	M.	43	Laborer.	Compound depressed fracture of right parietal bone; severe scalp wounds; unconscious.	Ice bags; drainage.	0	0	2d day, 99°; P., 58°; 4th day, 104°; P., 80°; 7th day, 103°; P., 158.	7	7th day, death from meningitis.
28	M.	28	Laborer.	Compound comminuted fracture of lower third of femur; simple fracture of patella.	Carbolic oil and cotton batting; 17th day boracic oint.	6	17	Normal.	108	
29	M.	25	Laborer.	Compound fracture of lower third of right leg.	Carbolic oil and gauze.	3	44	Normal.	92	
30	F.	8	Minor.	Compound fracture at middle of right leg.	Phenyle.	16	28	Normal.	72	
31	M.	35	Groom.	Compound dislocation of right ankle; compound comminuted fracture of right tarsus.	Dislocation reduced; fragments removed; phenyle.	5	10	Normal.	10	5th and 7th days, secondary hemorrhage; 8th day, amputation at lower third of leg; 10th day, death from exhaustion.
32	M.	28	Laborer.	Compound fracture at middle of right leg.	Cotton batting and phenyle.	4	42	Varied from 98° to 101°.	70	56th to 60th days, had erysipelas.
33	M.	26	Stonecutter.	Compound comminuted fracture at left knee joint; great laceration; face and eyes filled with gunpowder; severe bruise of left arm; much prostration.	Atropia for eyes; phenyle; stimulants.	1	2		2	Death from shock on 2d day.
34	M.	21	Laborer.	Compound fracture and dislocation of right ankle.	Phenyle.	6	20	2d day, 103°.	47	
35	M.	40	Laborer.	Compound comminuted fracture of frontal bone; severe laceration of scalp; unconscious.	Dislocation reduced; fragments removed; phenyle.	18	18	2d day, 100° 60.	25	Delirium till 10th day.
36	M.	41	Laborer.	Compound fracture of left arm; compound comminuted fracture of left hand; bruises of right thigh; face and eyes filled with gunpowder.	Amputation at wrist joint; phenyle to amputation and fracture; atropia for eyes.	8	21	4th day, 101°.	35	Union on 26th day.
37	F.	30	Mill operative.	Compound fracture of right leg.	Phenyle.	4	61	Normal.	101	Union on 95th day.
38	M.	41	Laborer.	Compound fracture at ankle joint; incised wound; with depression in frontal region.	Phenyle; ice to head.	2	4	2d day, 101°; 3d day, 104°; 4th day, 105° 5.	4	3d day, delirium tremens; 4th day, death.
39	M.	46	Laborer.	Compound fracture at lower third of humerus.	Phenyle.	3	11	Normal.	59	
40	M.	30	Laborer.	Compound fracture at middle of right leg.	Phenyle.	2	13	Normal.	46	
41	M.	26	Laborer.	Compound fracture of right ankle, with extensive laceration of foot.	Phenyle.	5	27	Normal.	224	27th day, first and second toes removed; extensive sloughing, sponge grafts.
42	M.	39	Teamster.	Compound fracture of upper third of leg.	Phenyle.	3	32	Normal.	86	
43	M.	34	Laborer.	Compound fracture of skull in the course of the sagittal suture; comatose.	Fragments removed; cotton and phenyle.	1	3	3d day, 106°.	3	Death on 3d day from meningitis.
44	M.	25	Laborer.	Compound fracture at middle of right leg.	Phenyle.	9	81	Normal.	114	
45	M.	31	Painter.	Compound fracture at lower third of left leg.	Phenyle.	9	56	Normal.	82	
46	M.	70	Railroad employé.	Compound comminuted fracture of malar bone; extensive laceration of face.	Fragments removed; cotton and phenyle.	10	20	Normal.	34	
47	M.	24	Laborer.	Compound comminuted fracture of fore-arm and fingers.	Amputation of third finger; phenyle.	11	43	Normal.	50	
48	M.	24	Laborer.	Compound fracture and dislocation of right astragalus.	Removal of fragments; phenyle.	22	102	Normal.	379	Large amount of necrosed bone removed.
49	M.	42	Sailor.	Compound comminuted fracture of lower third of left leg.	Phenyle.	7	42	Normal.	93	
50	M.	17	Messenger.	Compound fracture of jaw and superior maxillæ; simple fracture of ribs; laceration of tongue and muscles of neck.	Fragments removed; phenyle; swathe to ribs; feed per rectum.	4	4	3d day, 102°.	4	Convulsions and death from meningitis.

Number of Case.	Sex.	Age.	OCCUPATION.	NATURE OF INJURIES.	TREATMENT.	Number of Dressings.	Day, Dressings were Omitted.	TEMPERATURE.	Day of Discharge.	REMARKS.
51	M.	37	Agent.	Compound fracture of left femur; dislocation of right metacarpal bones; contusion of right hip joint; scalp wounds.	Phenyle; dislocation reduced.	6	30	Normal.	86	Union on 50th day.
52	M.	50	Musician.	One week after injury entered hospital with a compound comminuted fracture at middle of right leg.	Poultice; 36th day, myrrh; 55th day, phenyle.	10	105	Varied from 98° to 102°.	114	
53	M.	38	Tailor.	Compound comminuted fracture at lower third of right leg.	Phenyle.	2	26	Normal.	65	
54	M.	43	Lawyer.	Compound fracture of frontal bone.	Phenyle.	14	14	7th day, 103°.	16	7th to 10th days had erysipelas.
55	M.	62	Carpenter.	Compound comminuted fracture of right femur; great laceration.	Phenyle.	3	3	3d day, 101°.	3	Death on 3d day from shock.
56	M.	18	Teamster.	Compound dislocation of right ankle; fracture of internal malleolus of left leg.	Tendo-Achillis divided; dislocation reduced; phenyle.	14	60	6th day, 103°5'.	73	6th day, violent delirium.
57	F.	40	Wife.	Compound comminuted fracture at lower third of right leg.	Phenyle.	3	21	Normal.	40	
58	F.	15	Minor.	Compound comminuted fracture of nasal bones; rupture of cornea of left eye; great laceration of face.	Cold compress to eye; 17th day, removal of eye.	0	0	Normal.	21	
59	M.	35	Laborer.	Compound comminuted fracture at middle of leg.	Phenyle.	2	17	Normal.	25	Discharged with a plaster bandage.
60	F.	60	Domestic.	Compound comminuted fracture of left radius and ulna.	Fractured ends sawed off and wired; phenyle.	7	52	Normal.	62	
61	M.	22	Sailor.	Compound comminuted fracture at lower third of left leg.	Phenyle.	1	15	Normal.	28	Plaster bandage on 15th day.
62	M.	29	Laborer.	Compound dislocation and fracture of right ankle.	Dislocation reduced; phenyle.	7	50	Normal.	70	
63	M.	4	Minor.	Compound fracture at middle of humerus; great laceration.	Phenyle.	11	30	Normal.	54	7th day, operated for phymosis.
64	M.	31	Machinist.	Compound fracture of right radius and ulna; great laceration; collapse on admission.	6th day radius wired; phenyle.	14	28	Normal.	64	
65	M.	33	Hostler.	Compound comminuted fracture of left leg.	Fragments removed; phenyle.	13	15	Normal.	15	Removed against advice.
66	M.	11	Minor.	Compound comminuted fracture of right parietal bone.	Phenyle.	7	20	Normal.	21	
67	M.	41	Butcher.	Compound comminuted fracture of right leg.	Phenyle.	3	28	Normal.	80	
68	M.	23	Stonecutter.	Compound comminuted fracture at middle of right leg.	Phenyle.	5	22	Normal.	71	
69	M.	27	Stonecutter.	Compound comminuted fracture of upper third of right leg; severe convulsions; complete collapse.	Phenyle.	2	3	.....	3	Had lately recovered from typhoid fever; death from exhaustion.
70	M.	28	Laborer.	Compound comminuted fracture of jaw; deep, lacerated wound of neck.	Palliative treatment; fed per rectum; phenyle.	3	8	8th day, 103°.	8	Death from collapse.
71	F.	67	Laundress.	Compound comminuted fracture at upper third of left humerus; compound fracture at upper third of left leg; laceration of entire surface of right arm; collapse.	Palliative; phenyle.	1	2	2d day, 103°8'.	2	Collapse and death from shock.
72	M.	35	Trustee.	Compound fracture of frontal and maxillary bones, also of jaw at symphysis; simple fracture of nasal bones, and right ramus of jaw.	Rubber plate for jaw; phenyle.	35	35	Normal.	70	61st day, several pieces of necrosed bone removed.
73	M.	54	Lighthouse keeper.	Compound fracture at middle of right leg; simple fracture at middle of left leg.	Phenyle; splints.	3	21	Normal.	86	Union in right leg, 60th day; union in left leg, 51st day.
74	M.	8	Minor.	Compound oblique fracture of left leg.	Phenyle.	3	38	Normal.	79	
75	M.	20	Railroad employé.	Compound comminuted fracture of patella; much effusion into knee joint.	Ice bags; phenyle.	10	60	13th day, 104°.	90	

SURGICAL CASES—MASSACHUSETTS GENERAL HOSPITAL.—*Services of Drs. Bigelow, Hodges and Beach.* PHYSICIAN'S MAGAZINE, Vol. I, No. 3.

Number of Case.	Sex.	Age.	OCCUPATION.	NATURE OF INJURIES.	TREATMENT.	Number of Dressings.	Day, Dressings were Omitted.	TEMPERATURE.	Day of Discharge.	REMARKS.
76	M.	36	Sailor.	Compound fracture and dislocation of left ankle.	Phenyle poultice; 74 day phenyle Lister.	20	140	Varied from 98° to 103°.	179	Secondary hemorrhage on 111th day.
77	M.	39	Carpenter.	Compound fracture at middle of left leg.	Phenyle.	6	33	Normal.	45	
78	M.	23	Carpenter.	Compound fracture of elbow joint; excision.	Phenyle.	12	46	Normal.	55	
79	F.	15	Minor.	Compound fracture lower third of right leg.	Phenyle.	13	42	Normal.	102	
80	M.	18	Laborer.	Compound fracture at middle of right leg.	Phenyle.	5	25	Varied from 98° to 102°.	55	
81	M.	14	Minor.	Compound fracture of metacarpal bones.	Phenyle.	1	3	Normal.	19	
82	M.	22	Laborer.	Compound fracture at middle of left leg.	Phenyle.	2	7	Normal.	46	
83	M.	27	Railroad employé.	Compound comminuted depressed fracture of frontal bone.	Elevation and removal of fragments; phenyle.	30	30	4th day, 101.8°.	47	43d day, about ward and garden; pulsation of brain seen in opening.
84	M.	25	Laborer.	Compound Colles fracture of left wrist; simple fracture of three ribs on left side.	Fracture reduced; phenyle; swathe to ribs.	10	50	Normal.	57	
85	M.	26	Carpenter.	Compound fracture of left ankle.	Phenyle.	13	19	1st day, 104°.	67	
86	F.	10	Minor.	Compound fracture at lower third of left femur.	Phenyle.	3	30	13th day, 103°.	68	
87	M.	40	Laborer.	Compound comminuted fracture at middle of left leg.	Phenyle.	3	5	5th day, 105°.	5	Death on 5th day from delirium tremens.
88	M.	49	Glassblower.	Compound fracture and dislocation of left ankle.	Phenyle.	3	12	Normal.	23	
89	M.	50	Farmer.	Entered hospital three days after injury, with compound comminuted fracture at middle of left leg.	Carbolic.	11	26	14th day, 105°.	26	14th day, counter openings; 20th day, orchitis; 22d day, brawny, swelling of left arm; 23d day, delirium and involuntary dejections; 26th day, death from pyæmia.
90	M.	14	Minor.	Entered hospital two days after injury, with a compound comminuted fracture at upper third of humerus.	Phenyle.	19	80	10th day, 104°.	86	
91	M.	39	Railroad employé.	Compound comminuted fracture of metacarpal bones.	Phenyle.	4	28	Normal.	28	
92	M.	54	Farmer.	Compound fracture of the right scapula.	Phenyle; Velpeau bandage.	1	3	Normal.	10	
93	M.	22	Railroad employé.	Compound comminuted fracture at lower third of left leg; Colles fracture of right arm; laceration of scalp; punctured wound of ilium.	Phenyle. Phenyle.	15 2	42 3	10th day, 103°.	167	10th day, counter opening; 80th day, large amount of necrosed bone removed.
94	M.	44	Laborer.	Compound comminuted fracture at middle of left leg.	Phenyle.	11	81	Normal.	92	
95	M.	28	Teamster.	Compound fracture at upper third of humerus; extensive laceration of face.	Phenyle.	2	10	Normal.	20	
96	M.	27	Railroad employé.	Compound fracture of right radius and ulna; simple fracture at upper third of right humerus.	Carbolic.	8	30	Normal.	39	
97	M.	55	Laborer.	Compound comminuted fracture at upper third of left leg.	Phenyle.	8	14	.....	14	
98	M.	18	Laborer.	Compound fracture of tarsal and metatarsal bones.	Carbolic, with Iodoform gauze	5	21	Normal.	21	
99	M.	32	Printer.	Compound fracture of metatarsal bones.	Carbolic, with Iodoform gauze	9	29	Normal.	29	
100	F.	9	Minor.	Compound fracture at middle of right humerus.	Carbolic.	5	29	Normal.	32	

One hundred and seven compound fractures may be further classified as follows :

14	of the head.
1	“ scapula.
9	“ humerus.
1	“ elbow.
7	“ radius and ulna.
1	“ radius.
6	“ carpal and metacarpal bones.
7	“ femur.
1	“ patella.
1	“ knee-joint.
45	“ tibia and fibula.
7	“ ankle.
7	“ tarsal and metatarsal bones.

Of eight compound dislocations :

6	of the ankle.
2	“ astragalus.

The thirteen simple fractures may be classified as follows :

2	of the face, multiple.
1	“ humerus.
2	“ radius.
2	“ ribs.
1	“ pelvis.
1	“ patella.
3	“ tibia and fibula.
1	“ tarsus.

Of the simple dislocations :

2	of the humerus.
1	“ metacarpal bones.

There were 791 dressings applied, of which

699	were of phenyle.
88	“ carbolic acid.
2	“ thymol.
2	“ water.

Each patient had an average of 7·811 dressings applied, and the average length of time they were submitted to treatment was 33·67 days.

Eighty-eight patients had 699 phenyle dressings applied for 3093 days. To each patient, 7·94 dressings were applied 35·14 days. Ten patients had eighty-eight carbolic dressings applied for 283 days, being an average of 8·8 dressings applied for 28·3 days to each patient.

Poisoning occurred but once, and then from the use of carbolic acid. Thymol was substituted, but death followed five days after the poisonous effects developed themselves.

Death resulted in fifteen cases from the following causes :

Delirium tremens,	. . . . .	2
Meningitis,	. . . . .	3
Exhaustion,	. . . . .	3
Shock,	. . . . .	3
Collapse,	. . . . .	1
Secondary hemorrhage,	. . . . .	1
Pyæmia,	. . . . .	1
Carbolic poisoning,	. . . . .	1

There were but two cases of erysipelas, one lasting four days, the other three days.

The following abstract from the article written four years ago, explains the manner in which the phenyle dressings were applied :

“In using the spray, the solution is made sufficiently strong by mixing one part of phenyle with 250 of water ; but for instruments, hands and irrigation, one part to fifty, or from that to one hundred.

“In excisions of the breast and operations of a similar nature, the spray has been repeatedly omitted, the wound being thoroughly washed out before applying the dressing.

“The manner in which the phenyle dressings were applied commends itself for its simplicity, to the surgeon who does not find it convenient to procure the regulation gauze, or cheese cloth.

“The protective is applied as in the regular Lister dressing, simply to prevent the cotton from sticking to the edge of the wound. Soak a handful of ordinary cotton waste, cut into bits about an inch long, in a one to twenty solution of phenyle ; squeeze dry, and apply it closely to the end of the drainage tubes. Afterwards, place four layers of cotton batting, previously *well* soaked in the one to fifty solution and squeezed dry, over the wound, in the same way as the gauze is usually employed ; over all, a layer of dry cotton wadding, in order that the bandage which holds the dressing in place, need not compress the wound to such an extent as to make the patient uncomfortable.

“The cotton wadding should overlap the cotton waste at least six inches in *every* direction, for thorough protection. The cotton waste is an important part of the dressing, as it takes the place of the gauze in permitting the discharges to flow from a wound instead of accumulating and burrowing beneath the edges.”



