Record of Antiseptic Work with Eucalyptus Oil and Corrosive Sublimate.

Cases from the Surgical Practice of the Infirmary, Bury (Lancashire)
In presenting this paper on some of the surgical work which I have done at the Bury Infirmary, I have to state that I am under deep obligations to the Honorary Medical Officers of the Institution for giving me the entire management and supervision of the Antiseptic Department, while I was Resident Medical Officer at the Hospital. To their kindness and courtesy also I owe the opportunities which I had for practice in operative work.

J. C. Vogt

Bury - 1885

Edinburgh -
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with Eucalyptus Oil and Corrosive Sublimate
Cases from the Surgical Practice of the Infirmary - By Stent

Case 1. Edmund H. - Aged 73.
Admitted on May 3rd, 1884. Fracture of
Radix in lower third of the bone. After having
been washed with Carbolic Ether (1 in 20) the wound
was irrigated by means of carbolic acid in Fyenon
(1 in 10). Stitches of sulphurous acid catgut
were used and the dressing consisted of a
small piece of green protective starch in
the carbolic gauze and covered by a layer
of Salicylic wool. This wool was made
to overlap the protective well on all sides.
Wooden splints (carbolicised) and padded
with salicylic wool were applied. The
front splint had a window cut in it.

Ten days after admission the dressing
was removed. After one and a half
weeks a starch bandage was applied.

None of the unnum has occurred although
the wounds were quite healed. The
process of healing was expeditious.
The case was discharged and, after
the starch bandage had been worn for
nearly 6 weeks, union had taken
place. Number of dressings 2.
Result, Cure without undetected
defect or wound history.
Case 2
Mrs C — at 41. Admitted May 7th. Abscess in lumbar region (left side) treated with carbolic spray. Temperature ranging from 99° to 101.5° until the second week of treatment. Discharged cured on June 3rd. Number of dressings 10.

Case 3
James H — 19. Admitted May 19th. Injury to three fingers by machine. Temperature of injured fingers and dressing by carbolic spray (in protection) and relief with cool sulphurous salt. Change of dressing on 10th day after operation. Stumps found healed but two of them looking red and swollen. Redressed 3 days after and two small slits abscesses opened. Exudate found undrained in one of these abscesses. After removal of source of irritation rapid cure resulted.

Case 4
Joe B — at 39. Amputation of leg for ulceration of 25 years duration. Patient very emaciated and exhausted from long continued discharge and suffering.

At June 5th Dr Nuttall operated under the carbolic spray. Deep wound sutures and superficial catgut stitches were used to fill the long gap and a suction dressing was applied after the operation. Three days later the dressing was changed.
under the spray. The wine patures, it was found, had cut their way through the edges of the long posterior flap, which was hanging down nearly quite separated from the anterior one. 

The patient's temperature had risen to 103°F. A dressing of bit  

slept on in 1 part of eucalyptus 6 of olive oil was now applied; the flap being supported by dressings. After this the case was looked at every third day. The temperature soon became normal again and seven weeks after the operation the patient could leave his bed; but an obstinate open ulcer remained on the anterior aspect of the stump. I failed to remedy this by skin grafting because I regretted to think little operation too soon. Sulphate of copper and sulphate of lime lotions were abandoned for a dressing with dry saccharated carbonate of iron. Under this application the sore was reduced to half its former size and the surface became much healthier looking. In the beginning of August when the patient was discharged from hospital, his general health had very much improved. His weight was several pounds more than when he was
was admitted, but the ulcer still remained unhealed. At the end of the year, when I was preparing my report, C. B. was an outpatient and the ulcer was then treated by the application of an ointment of Iodoform and Eucalyptus (Gale & Co. preparation) on Iodoform gauge. Frequently repeated baths of Convolvulus Sublimate Solution (1 in 2000) were also being used. Improvement was taking place under this treatment.

Case 5. L. M. R. 25, a man in the service of the Lancashire & Yorkshire Railway Company was admitted on the morning of June 24th. With his right foot and ankle crushed by the wheels of a railway truck passing over them. The leg was amputated that morning by Dr. Fletcher. After all hemorrhage had been stopped the long posterior flap was sutured by deep, and superficial sutures and a dressing dressing applied. Then, gauze was used during the operation. The dressing was changed under the strain. Three days later and the drainage tube was then removed. This case showed an acrobatic temperature curve during all the time it was under treatment. The wound healed beautifully.
The patient left his bed a month after the operation and was discharged cured a week later.

Case 6. Mrs. 18 — at 67.

Admitted early in June and operated on on June 19th. The injury to the foot had led to necrosis of the first phalanx of the second toe. High evening temperatures and great debility. On June 19th removed the necrosed toe and applied a dressing of ipecacuanha in olive oil (1:5). Debrided changed 5 days after. Temperature normal. Patient discharged cured 14 days after operation. Number of dressing 33.

Case 7. William S., 16. Admitted 6 days previously was operated on June 21st for Caries of the 8th Calcis. There was a history of injury and of treatment by a home operator (= more injury). A small opening discharging thin pus was found to lead to the outer surface of the 8th Calcis where rough and soft bone could be felt by the probe. By a careful incision the diseased spot was laid bare. The disease was found to be quite limited. The carious bone was removed by gouging and scraping. The cavity was cleaned out by the sharp (gouge and the bone gong). Carbolic spirit was used for irrigation and oozing with salicylic
Selicylic wool and gauze bandage applied. Dressings every 3rd or 4th day. After 6 weeks the patient was discharged cured.

Case 8. Mrs G — at 47. Admitted on June 23rd Liverblad Cancer of right Adnema. On June 28th Dr. Pelton operated removing all the affected gland. Kingston R. carbolic spray during the operation. Leg salicylic wool dressing. Died 4 1/2 days later. Discharged cured 16 days after operation.

Case 9. Mr. A — at 36, admitted July 4th. Extensive burn on back and right arm. Had fallen on a stove whereas in an epileptic fit two days previously. Is in great pain. Carroon oil dressings had been applied by Dr. Harris of Whitington who had seen the case and was sent for in. These dressings were left on and big doses of opium repeated several times until sleep was obtained. Temperature found rising.

Next day the case was found swelling rather offensively and the temperature was over 102° F. Fresh carroon oil dressings were applied. Nearly half the surface of the back was found
found affected by the burn. Extensive
thickening was going on, but in some parts
the entire thickness of skin had apparently
not been destroyed. About \( \frac{3}{4} \) of the
surface of the upper arm was also in-
volved in the injury. Much pain was com-
plained of, and the temperature remained
high. Opium had to be continued. Two
days later the temperature rose to an alarming
degree, and the smell of offensive
discharge from the burnt surfaces was
noticeable in every part of the ward.

The patient was therefore removed to
a separate small ward, and here I
procured a spray of eucalyptus oil
from pure undiluted eucalyptus oil
in the spray bottle. The carbon oil discharges
were removed, and the eucalyptus spray
turned on. It was rather unpleasant
to work in the cloud of strong eucalyptus
vapor thus obtained from the steam
forming an emulsion with the eucalyptus
oil drawn upwards from the bottle, but the patient did not
complain of experiencing even the
slightest pain from it. An emulsion
of eucalyptus and olive oil (equal parts)
to about three parts of Vaseline
was applied each day by gauze bandages.
Next day, for the first time since admission, the temperature was normal. The dressing was left on for two days longer and then replaced by a similar one freshly prepared. A remarkable change for the better was observed in the appearance of the wound. The dressing was again renewed 3 days later. At these points were the sloughs had already separated healthy granulations were seen, and at every subsequent change of the dressing there was noticed springing up in fresh places and growing with remarkable rapidity. At the edges of the wounded surfaces also white lines of epithelial tissue were soon seen spreading outward over the adjacent granulations. Some islands of skin, scattered here and there over the burn surfaces, had escaped destruction and these soon began to behave in the same way as skin grafts, gradually enlarging at their circumference. To assist the healing process, skin grafting was then resorted to, and when the first crop of grafts had ceased growing the grafting was again performed. After the patient had been about two months in hospital, the operation of skin grafting had been performed four times.
125 grafts had been planted altogether and all that now remained of the original injuries on the back were two open sores— one about the size of a half crown piece and situated opposite the right scapula, the other about three times as large, on the lumbar region. On the inner aspect of the right upper arm there was still a large surface (about 5 in. long by from 1½ in. to 5 in. broad) uncorred by skin and another opposite the elbow, smaller in extent but healing very slowly. After all these surfaces grafts were again applied and the necessary oil dressing was continued. The patient left the hospital at the end of September and after some weeks treatment as an outpatient, all the wound surfaces were healed.

Case 10

Mel B — at 57. Labourer at an iron foundry. Admitted July 12. Wound to upper arm. A large incised wound along inner surface of upper arm severing muscles and veins, exposing but not implicating the brachial artery and baring the humerus in its middle part. The tissues round the external condyle also were bruised and bloody and there was a small lacerated wound about 3 or 4 in. long, above the condyle.
condyle. Under irrigation by means of eucalyp
tus in olive oil (1:5) the edges of the large
lacerated wound were brought together and joined by
numerous close sulphuruous acid catgut
sutures. The deep parts of the wound were
also opposed and tissued and a rubber
drainage tube was inserted. A drenching of
eucalypthus in olive oil over gauze was
then applied over both wounds and several
layers of saline's court were put over this.
The entire dressing was then fixed by a
gauze bandage. Three days later the
wound was redesigned and the drainage
tube removed. Irrigation by eucalypthus
was kept up during this and subse-
guine changes of drenching. The large
wound on the inner surface of the
upper arm healed beautifully and
rapidly (apparently by first intention)
but the small wound on the external
condyle behaved differently. The bursied
and ecchymosed tissue sloughed and
a small sinus formed which had to
be slit open before it could heal.
The eucalypthus drenchings were continued and
eventually an open wound surface
with healthy granulations all over it was
obtained after separation of all the
slough. This surface was then grafted and
and the patient was discharged from hospital about 6 weeks after admission. It was then treated for 3 weeks as an outpatient, at the end of which time all the infected surface was healed. A very fine hair cicatrix was left on the inner surface of the upper arm where the large wound had been.

Case 11: David S — at 43. Admitted July 19th. Haemorrhagic gangrene of leg. The patient had sustained an injury from a heavy weight falling on the dorsum of the foot some days previous to admission. On the 20th the temperature was rising and the leg was looking very black. A line of demarcation could already be made out. That afternoon the foot affected was amputated. Exactly two dressings were applied and changed after four days. Fifteen days later than the operation the case was discharged cured.

Case 12: Patrick H — at 34. Admitted July 27th. Injury to left foot from a fall of broken glass, falling over 12 or 3 days before admission. The entire dorsum of the right foot was covered by slough. The extent of the injury to the left foot was not so great. Dressings of eucalyptus oil applied.
applied and changed every 1st day. The 
lesion gradually separated, the patient's 
temperature became normal, and the 
pain which had been severe, was gone. 
Healthy granulations soon sprang up and 
the edges of the wounded surface grew in 
wards rapidly. Seven weeks after admission, 
the case was discharged cured.

Case 13. - Maria H. — cat. 14, 
admitted Aug. 3rd. Scald by boiling 
water of right foot and leg. Eucalyptus 
oil in olive oil was applied and 
then the ointment of eucalyptus and 
calamine every 1st day. The case 
showed an algebraic temperature chart 
all through the period of treatment. 
The skin on the anterior and inner 
surfaces of the leg and in the dorsum 
of the foot had been destroyed by the 
injury. and after granulation growth 
had fairly commenced, skin grafting 
was resorted to. This had to be 
repeated 5 times while the patient 
was in hospital. The case was dis- 
charged nearly two months after admission 
and the scalded surfaces were at that time at 
most entirely covered by new skin growth. 
The patient was treated outdoors for 
another fortnight and was then cured.
Case (Continued)

Case 14. Annie G. — aged 16. Hill had admitted Aug. 9th with an injury to the left leg. This was a wound which had led to the formation of a large deep ulcer on the outside of the leg. Dry iodoform powder was applied and over this some iodoform gauze with the deeper layer smeared with an ointment of eucalyptus and iodoform. The dressing was left on for a week, at the end of which time the ulcer was found to fill up rapidly from the bottom. The edges also had spread inwards and the surface of the sore was therefore much smaller. A similar dressing to that above described was applied and after this the case was dressed once a week until the third week of September when the girl went home. She was made an outpatient and three weeks later the treatment was completed, the ulcer being cured.

Case 15. Ellen B. — aged 57, admitted on August 13th suffering from specific ulcers of right leg. This patient had been in the hospital during the previous year and had then been getting inside of Biocerein and mercury.
internally. Under this treatment, combined with the application of iodiform locally, the ulcers had then healed. On readministration of the lower and middle parts of the inner surface of the leg was found to be one mass of closely studded specific ulcers, here and there merging into one another and with edges deeply undermined. The discharge was very offensive. The sores were washed every day with Caroverine Sublimated Solution [i.e., 1:1000] and iodiform dressings were applied. Iodide of potassium was again given internally. Two months after admission the ointment of eucalyptus and iodiform was substituted for the iodiform dressing. The case was discharged cured in October, about 9 weeks after admission.

Case 16. Mrs C — age 55.

This case was admitted in August and was one of extensive chronic ulcers of the left leg. These ulcers, three in number, had a history of three years' duration. Strict antiseptic treatment being indicated, the sores were washed every 3rd day with a solution of 1:500 Caroverine Sublimated. Sublimated wool
wood wool was the dressing material. At the first change of dressing, however, the wood wool was found adhering to the ulcerated surface so firmly as to cause some pain on removal. The wood wool was next applied in small sublimated gauze bags. Part of gauze also adhered to the surface of the sore and this made the process of changing the dressings painful to the patient. Besides, after several days dressing with sublimated material (free irrigation with corrosive sublimate lotion being employed every third day) the case did not appear to be making much progress towards recovery. To deform dressing was then employed with the sublimate dressing for a week or so. The result being still unsatisfactory, corrosive sublimate in glycerine in the high proportion of 1 in 100 parts was employed. This was first tried (applied on list) on one of the sores only. Its application caused the patient to complain of some smarting pain at the time but when the dressing was changed 3 days later, the sore which had been dressed with the corrosive sublimate in glycerine looked so much better than the other.
often two that the same dressing was now used for them. The top dressing consisted of wood wool. These strong sublimate dressings cleared away all the rough skin from the ulcers, the bases of which were now seen covered by healthy red granulations. The adjacent skin surfaces had become considerably irritated by the constant sublimate dressings and lotions. There was considerable redness round the sores and the cuticle was peeling off in large patches. The ointment of eucalyptus and calamine form was now used and this was followed by zinc ointment for the only remaining ulcer. The two larger ones had entirely healed by the end of October and the patient was discharged cured.

Case 171. Lily N.—Age 13. Admitted Feb 10, 1913, for gas gangrene. The Ewen's operation on August 20th. After the bone had been chiselled through above the condyles, by means of the Ewen's graduated chisels, the limb was straightened and fixed on a well padded splint. Irrigation by carbolic glycerine was kept up during the operation and the dressings consisted of protective sponges in carbolic glycerine.
and well covered and overlapped on all sides by dry salicylic wool. Over this came the gauze bandage, which at the same time fixed the limits to the splint. The dressing was left on for a fortnight during which time the patient's temperature was normal night and morning. Six weeks after the operation the splints were removed. The dressing had been changed once only, viz. on the 12th day, when the wound was already sound healed. The patient left the hospital with a very useful limb seven weeks after the operation.


Case 19. J. L. at 63.
Admitted on September 2. History of injury to foot. Large deep abscess. Smaller plantar fascia. This abscess, after being evacuated, found to communicate with diseased bone. After syringing and irrigation with a solution of 1 in 500 corrosive sublimate...
Sublimate, wood wool sowed in gauze bags, applied and fixed by gauze bandage. This dressing afterwards changed every three days under corrosive sublimate irrigation. Seven weeks after admission the patient desired to go home and was discharged. The case did not again come under observation.

Case 20. Noel M. — at 41.
Admitted Sept. 6th. Compound Fracture of Tibia. After synovial and washing with Corrosive Sublimate (1 in 100) a sublimate dressing was applied and the limb put up in the swing cradle. The dressing was changed seven days later. Discharged cured on Oct. 20th. Number 7 Discharge. Normal temperature while under treatment except on the third day after the injury when the thermometer registered 101.6° in the axilla.

Case 21. Thomas M. G. — at 42.
Admitted in July with Gout: Inflammation of the Knee Joint. Rest, strapping, extension by weight & pulley, application of Corriqia, buttion casters, and internal administration of Cod Liver Oil and Syrup of the Phosphates & Sodiu of Iron had been the treatment until Sept. 22nd, when at a consultation of
of the entire medical staff of the hospital, as the affected joint, as well as the patient’s general health, showed signs of breaking down, amputation of the thigh was decided on.

I performed the operation on that day. The method chosen was that of Professor Spenke. In cutting the long anterior flaps the knife passed through three different sinuses which were found to communicate with the diseased joint and to open by small apertures high up on the inner surface of the thigh close to the groin. After the flaps had been cut and the bone exposed, all haemorrhage was stopped by tying small nodes by sublunary catgut and the muscular with sublimated silk thread. The sur- faces of the flaps were then washed, and the sinuses syringed out with corrosive sublimate (1 in 100). A piece of wood gauze  protective was first put on the line of union of the flaps (posteriorly) and over this a couple of pads of wood wool in gauze were fixed firmly by gauze bandage. Deep stitches of sublimated silk and superficial ones of catgut had been used to keep the edges of the flaps together. The former were removed on the 15th day after the operation, and the drainage tube was then also taken away. The superficial catgut stitches, however, were not suffi- cient.
sufficient to maintain union between the flaps. They were perhaps not numerous enough or the deep stitches had been removed too early. At any rate, when about 8 days after the operation and 4 days after the removal of the deep sutures, the limb was again examined, the flaps were found to be gaping at the outer part of the stumps. The large anterior flap was seen to hang loose here. On the lower and inner surfaces of the stumps the flaps were in close opposition and uniting. The defect was remedied by again placing deep sublimated silk sutures by means of the lancet knife so as to grasp both flaps where they had been separated and draw them together. A sublimated dressing was then applied and left unchanged for 10 days, when removal was found to have taken place and the deep sutures were removed. After this the case was dressed once a week. Sublimated wood wool dressings were employed all through the treatment and irrigation by means of corrosive sublimate was kept up when the dressings were removed and fresh ones applied. The case progressed slowly and it was not till 10 weeks after the operation that the patient was discharged from hospital. Even at that time there was...
was still some amount of discharge evidently
coming from the remains of those deep burrow-
ing sinuses which had been found extending
high up under the muscles of the thigh
at the time of the operation.

Case 12
Sarah A L., 26, 21,
was admitted on the day when the preceding
case was operated on. She had sus-
tained an accident by which her hand
and wrist were crushed in the wheels of
some machinery in a paper mill in
the town. Traumatization the forearm
above the wrist on the same day
(Sept 12th). The flaps were united
by numerous close sutures of
sulphurous caustic and a solution
of sublimate. Debriding was applied after
free irrigation of the parts by corrosive
sublimate solution (1 in 1000). No
drainage tube was inserted and the
wound was left undisturbed for three
weeks. During all this time the tempera-
ture had been normal. The patient was
discharged cured one month after operation.
The stump was then entirely healed with
the exception of two or three small
granulations at the outer side. These
were debrided with the intention of decalci-
ification and lyses movement; but showed no tendency

...
to cicatrize till 17 weeks after the operation; a small piece of catgut was detected firmly embedded in the tissue and protruding into the largest of the granulations. This catgut was quite hard and solid, and after it had been removed the little sore healed in 14 days.

Case 23. Willie W—at 15, millhand. Admitted Sept 29th. Compound comminuted fracture of humerus and great laceration of soft parts. Amputation below shoulder on the same day by Dr. Barr. Irrigation by corrosive sublimate and wood vinegar. First change of dressings 10 days after operation. Discharged cured on Novt

Case 24. Susan B—at 32, admitted on Oct 13th. Deep ragged ulcer on dorsum of right foot. There is a history of local injury after confinement. Patient complains of great pain and edema. Urea temperature. Nearly half the dorsum of the foot is involved in the ulceration. Ulcer has been going on for some days without treatment. Very fetid smell. The foot was irrigated with a solution of corrosive sublimate. Some iodine ointment was then rubbed on the part.
Temperature Chart

Case 24 - Susan B.

Septic sore on bottom of foot treated by repeated corrosive sublimate irrigations and sublimates (wood-wool) dressings.
part and a wood wool dressing was ap-
plied over this.

On the night of Oct 13th the temperature
was 101.2°F. Next morning it had fallen
to 98°F but it rose again at night and
continued to do so all day. On the evening
of the 15th it again rose to 101°F.

Free irrigation and repeated dressings
of sublimate wood wool with iodine
continued to be the treatment.

On the morning of the 16th the temperature
was normal. On the afternoon of the
17th the trouble on the dorsum of the foot,
which were found completely destroyed and
healing tissue on the floor of the ulcer,
were cut away and the wound. Free
irrigation sublimate irrigation was repeat-
ed and a sublimate dressing reapplied.
Irrigation repeated on 18th and 19th.

On the morning of the 19th the temperature
had fallen to 97.2°F. At 10 a.m. on the
20th 97.4°F at 9 a.m. 99.2°F was regis-
tered. All this time the patient was in
a state of collapse. An extremely feeble
and slow pulse, gastric pains, vomiting
and anorexia gave some cause for
anxiety. On the morning of the 21st the
temperature had fallen even lower and
symptoms of extreme collapse continued.
Case 24. Susan B. (continue)

The pain in the stomach and the vomiting had ceased. No mercurial fever could be observed, although on the previous day there had appeared to be some fibrillary movements and unsteadiness twitchings of some of the muscles of the face and arms. The dressings were left on. In the course of the day (21st October) the symptoms of collapse began slowly to disappear.

Next day the temperature was normal. Although the pulse was still somewhat weak, the patient's appetite was good and she was free of all pain.

The dressings were not again removed till two days later when the healing process was found to have fairly set in. Both the base and sides of the deep cavity which had been made on the dorsum of the foot by the badly ulcer were covered with healthy and granulations. The history subsequent to this date is one of rapid cure under the treatment of eucalyptus and coloform. The patient was discharged from the hospital in November.

Cases 25, 26, 27, 28 (Outpatients)
in mill operatives. They were treated antiseptically, corrosive sublimate being the antiseptic agent employed.

25. Henry J. at 33.
Lacerated and incised wounds of hand.
Corrosive sublimate irrigation and wood wool dressings. First change of dressings 14 days after injury. 22nd re-dressing 1st cured.

Self-inflicted lacerated, incised wound of palm and finger. No fractures.
Irrigation, repulsion, catgut sutures. Sublimate wood wool dressings. First change of dressings a fortnight later. One month after injury second change of dressings. Catgut sutures then formalinized and caused much irritation. Umbilicated dressings applied. Rapid cure after this.

27. Mary Allen H. at 16.
Lacerated and incised wounds of right hand and fingers. No fractures.
Irrigation, repulsion, catgut sutures. Sublimate wood wool dressings. First change of dressings a fortnight later. One month after injury second change of dressings. Catgut sutures then formalinized and caused much irritation. Umbilicated dressings applied. Rapid cure after this.

Compound dislocation of 1st or 2nd proximal phalanx of thumb. Although the joint was quite open and had been so for nearly an entire day when the case was admitted, an attempt was made to save the phalanx because operation was refused. The dislocation was reduced and, after irrigation with the sublimate solution, close antiseptic catgut stitches were inserted to bring the edges of the wound together. No bandage was used for dressing. The result was as follows:—

State symptomatic; no superficial frequent dressings. After some pieces of cartilage had come away with the discharge, the inflammatory symptoms gradually subsided under free daily sublimate irrigation.

A stiff joint was left.


Wound on ulnar side of dorsal surface of hand; 5th metacarpal—phalangeal joint quite open and little finger dislocated on metacarpal bone. Dislocation reduced and wound sutured. Corrosive sublimate irrigation and wood wool dressing.

First change of dressing, 14 days later. Wound healed, moveable & useful joint.
Case 30  John C — b. 15.

Weekand. Admitted Nov 12. Injury to arm by machinery. Larger part of lower 2/3 of upper arm denuded of skin on its posterior and internal aspects. Part of external surface also. Nearly the entire upper half of the posterior surface of the forearm has the skin hanging loose from it. Subcutaneous tissues of lower part of upper arm and of upper part of posterior surface of forearm (and that covering that elbow joint) thus exposed. All the large superficial veins are intact.

The wounds were well washed with sublimated lotion and the loose hanging skin was pressed close to the wounded surface of the forearm and fixed in position by the dressing which consisted of sublimated absorbent cotton steeped in corrosive sublimate and glycerine (1 in 500) and covered with dry layers of sublimated cotton. The entire dressing was fixed by gauze bandage.

First change of dressing on Nov 16. removed the upper part of wounded surface above elbow in order to the already eschar immediately subjacent to the gauze...
gauze, as well as some part of the deeper layers, stained a deep yellow color. Some of the deeper layers were a deep red stain in the deeper layers of the healing. In the intermediate layers yellow merging into red.

Wound perfectly clean and sweet. Not the least drop of pus anywhere. Loose skin, however, covered black in patches. Irrigation with corrosive sublimate solution and drenching consisting of absorbent cotton wool (sublimate) over the wound. Wool pads and gauze bandage.

Next change of dressing on Nov 24.

While this second dressing was on (on the evening of Wednesday 19th) a rash was noticed on the patient's body. This was of the nature of a more or less diffuse papular eruption. On the chest and abdomen it resembled Rubella. Over the urine regions and on the face it was a fine, punctiform rash and in some spots on these parts there was such a diffuse red blush as to closely resemble scaldational eruption. There was no rise in temperature. The face was pale and quite free of eruption. The rash was not marked.
marked on the left side of the body there on the right. The left arm was entirely free of it. The right shoulder and upper part of skin of the arm below it presented a deeper red tinge than any of the other parts affected. The individual papules also were larger and more distinct over the right shoulder than anywhere else. The face was very pale and showed no trace of red. The tongue was clean and moist. There was slight pain in right side region.

Next day (Friday 26th November) the rash was more defined. It remained out all Saturday and began to fade on Sunday. There were only slight traces of it left on Monday morning. By Monday evening it had disappeared entirely.

On Nov 24th the dressing was changed. Gauze taken off. Discharge found soaked through in parts. At those points where this has occurred the wound at the sternal greenish blue. The rest of the wound is well there parts not soaked through with discharge are unstained.
The deepening beneath the wood wool (subland of absorbent cotton) also stained green. Here the staining is more distinct.

Wound depth. Loose skin bleeding. Eucalyptus oil dressing was applied.

Nov 27th. Redraped (etc.). The surfaces demanded 1 skin now found offered with healing granulations.

Wounds: surface of posterior aspect of forearm found covered with black slough. This black mass however, kept in extent than at previous deepening. Good deal of it quite loose and therefore removed by means of scissors and dressing forceps.

Healing granulations underneath.

Forearm redraped with Eucalyptus and glycerine (1 in 10) on dress. Over this a thick fold of iodoform wool overlaid all a gauze bandage.

Upper arm. Internal, posterior, and external surfaces of wound grafted with skin from the foot.

12 or 14 pieces towards the anterior margins of the internal surface. These closed with green protectives soaked in boracic oint (1 in 40).

20 pieces (taken from vertical surface of foot) grafted on the external and internal
In closing surfaces. Those on the external part of the wound were covered with wood glue's protective plaster in 16. 000 proof alcohol. Those on the posterior surface covered with the dry wood glue acted over both posterior and external surface a dressing of iodine form wool and over internal surface a dressing of boracic lint (lint soaked in saturated solution of boracic acid) covered by a layer of iodine form wool.

The entire dressing fixed by gauze bandage and left in all December. Only one graft could then be seen and this one was situated on the external wound surface, towards the exterior mucous. It was adherent and apparently growing. Boracic lint was now applied over all the surfaces of the wound and this was covered with iodine form wool.

A gauze bandage was used to fix the dressing.

Dec 12th Several grafts (4 or 5) are now seen on the internal surface where boracic acid had been applied to the grafts, and on the external and posterior surfaces where sublimate applications had been used.
well, the grafts now visible are
seen more luminous. Some are of a
yellowish hue and others quite white.
The margins of the wounded surfaces
are white and are growing in-
wards very rapidly. Where the subacute
applications had been applied to the
grafts there are numerous depressions
among the granulations. Many of
these appear to be growing grafts.
Endeavours to destroy these applied
over all the grafted areas and
also on forearm from which more
black slough was removed.

Dec 16th (Morning)
All the slough removed under Eucalyptus
spray. On the internal aspect posteriorly
the white excoriated skin margins have
run into the areas of some of the
grafts. Two distinct brownish yellor
spots are noticed imbedded in healthy
white excoriated tissue. 2 or 3 other
grafts are seen 2 or 5 times as large
as they were at the time of the previous
dressing. These grafts are separated
from the bluish-white margins by
healthy granulations which are shown
being rapidly covered over.
At the posterior and external surfaces numerous little grafts are distinctly seen. These are now all of a whitish color. They are smaller than those on the internal surface. The edges of the wound are here also spreading upwards rapidly by thick white flakes of cicatricial tissue.

With the eucalyptus spray playing on the wound, the rest dressing was now applied. As the black cloth on the forearm was now all removed the dressing was made continuous over the wounded surfaces above and below.

Green protective steeped in eucalyptus and olive oil (1 in 5) was used to cover all the wounded surfaces. Overlapping this was a thin layer of absorbent cotton wool which had been (at the time of dressing) steeped in and wrung dry out of pure undiluted Eucalyptus oil. This cotton wool was applied in a flat continuous layer so as to overlap all the protective. Immediately over this, and extending beyond it above and below, we placed folded woolen cloth wrapped round.
the upper and forearm. Carbonic acid
bales were used to fix the dressing.
Which was left on until 6.30 p.m.
and the wound was then found perfect
ly sweet. Some more skin grafts
were put on that day. As no further
supply of frog grafts could be obtained
the skin was taken from the
patient.

Early that morning (Dec 19th)
a bad railway accident with several
large open wounds and compound
fractures had been brought into the
house with severe symptoms of
shock and collapse. This man
died about 1.30 p.m. The
grafting operation was undertaken
about 3 o’clock. The corpse
was still lying in the next bed
to the patient when this was done.
No spray was used.

The grafts were placed on the upper
arm of the large wound surface on
the upper arm and covered with
great protective sheet in boracic
solution. Nine others were put on the
other surface and covered with
sublimated protective (protective
steeped in (1 in 200). A strip of
kid
Case 30 — John C. (continued)

and Spiritus Letharis Nitrosii in water. On the 22nd the temperature was 100.7 and the appetite was returning. On the 23rd the rheuma had disappeared from the shoulder and the temperature was again normal.

Sec. 24th — Released.

The erysipelas returned but all disappeared again. The wound looks healthy. None of the grafts last applied are remaining.

On January 28th 9 grafts put on the internal surface (when the bovine lobatnum had up to this time been employed). These grafts were now covered with pieces of protective soaked in Corrosive Sublimate lotion (1 in 2000). On Jan 5th it was seen that every one of these grafts had failed, apparently because the surfaces of the wound gave rather two free a reaction of pus and were not quite suitable for grafting.

On the posterior surface prepared the elbow a long white graft is seen growing and spreading beautifully. This seems to be one of the graft skin grafts first applied.
Owing to iodiform and eucalyptus oil not being put on, 30 more grafts were applied. On Jan 10th it was found that only a very few of them were taking. To get the surface into a better condition for grafting, a dressing consisting of fine gauze steeped in eucalyptus is rectified spirit (1 in 5) was renewed to be left on till Jan 15th, when a fine healthy-looking surface was found. On that day 25 fresh grafts were put on. Of these (a) 6 were dressed with eucalyptus and olive oil (1 in 5) on pieces of green protective which were made to cover the graft.

(b) 8 were dressed with a piece of iodiform gauze smeared with the ointment of eucalyptus and iodiform. These 14 had in addition a top dressing consisting of layers of iodiform gauze steeped in rectified spirit and eucalyptus oil (1 part of oil to 8 of spirit) and warming dry.

(c) 12 others had a covering consisting of nothing else than folds of dryorris sublimate gauze. The top dressing for these grafts also consisted of orris sublimate gauze.
Of the remaining 9 grafts: 3 had a covering of pieces of green protective sublimated in the 1 in 2000. 6 were covered by wood glaze protective also finely sublimated in 1 in 2000 solution.

The top dressing for all three different areas consisted of dry sterile gauze, which was continued over the top dressing of the areas (a) and (b). These dressings were left undisturbed for 5 days. When they were removed it was noticed that the sublimated wood glaze protective, which had been used as a dressing for 6 of the grafts as above described, had caused a great deal of irritation of the adjacent surface. The granulations had grown into the skin, thus interfering with the healing. A good deal of blanching resulted when this so-called protective was taken off. The surface of the grafted area (e) was therefore now defaced with pieces of green protective sublimated in corrosive sublimated solution. The other 4 grafted areas were defied in exactly the same way as on the previous occasion.
Jan 24th Case redressed and last seen of the 6 grafts which had been treated with a deep dressing consisting of pieces of green protective gauze steeped in kerosene and olive oil (W. J. were growing). (B) of the 8 under eucalyptus and tellurium ointment 3 seemed to be taking. (S) of the 12 grafts dipped with dry copper sublimates grew 9 survived. (B) the three dipped with sublimated green protective gauze were all growing. (S) of the remaining 6 which had had been dipped with sublimated wood graft protective and subsequently with sublimated green protective, not one was left.

The surface of the wound was now much diminished in size. The edges were still spreading inwards over the granulation, which were all looking healthy. Many of the original grafts had entirely disappeared, but others had coalesced with adjacent growing skin margins. The wound surface on the dorsum of the forearm was almost entirely healed up, showing a firm smooth cicatrix.

Case 31 Patrick D — at 33. Admitted Nov 12th Compound Fracture of rightibia. 2 small wounds on anterior surface communicating with the
The fracture - also fracture (simple) of flap. After irrigation with warm saline solution, a dressing consisting of strips of sublimated absorbent cotton and Ellis' splints were applied. A Catholic gauze bandage was used to hold the dressing and splints in position.

On Nov. 20th a small red spot was noticed on the outside of the gauze bandage. Blood had soaked through at this point. The splints were removed and the dressing examined. It was found that blood had soaked all through the sublimated cotton and become dried in the dressing. The outer dressing (gauze) had not been penetrated by the blood except at one point. The wound was already found quite infected and the flap showed merely a small superficial abrasion. After irrigation a fresh dressing consisting of sublimated gauze as a deep dressing and salicylic wood as an upper covering was applied and the flap was put up in the Rising Cradle.

This case required no further dressing and was discharged in December.
Case 32. Peter H. - 4.
Admitted on Nov 12th. Injury to head.
Large open wound along whole surface
of left hypothenar eminence. Wound
also on dorsum, between metacarpal
bones of thumb and index finger. Com-
posed fracture of two metacarpal
bones. After the wounds had been irrigat-
ed, stitched, and syringed out with
corrosive sublimate solution, a
drying of sublimated absorbent cotton
was applied.
Nov. 15th. (evening) On examine-
the drying was found soaked through
with petrified blood. The color of
portions of the sublimated cotton un-
removed was quite black. The smell
was very offensive. The wounds were
again syringed out with corrosive subli-
mate. A fresh drying of sublimated
absorbent cotton was put on and pads
of Hartmann's Wood wool were fixed
over this by a gauze bandage.
Nov. 18th. The case was relieved.
Still much putrid smell. Septic pus.
On dorsum of hand another ulcer has
been formed by purpura discharge tur-
rowing through.
Nov. 20th. Not so much smell. Hand
Now
more submerged in a 1 in 1000 solution (after having been washed in another basin containing sublimate solution of the same strength). A curtain of sublimate gauge shot on under the surface of the solution. A dry sublimate dripping outside this.


Dec 6th. Redressed.

Dec 23rd. Redressed.

Jan 3rd. As the constant application of moist sublimate material is causing some irritation, a eucalyptus dressing now used. This consists of a strip of fine gauze steeped in eucalyptus and olive oil (1 in 5) and wrapped in a layer of absorbent cotton wool freshly wrung dry out of pure undiluted eucalyptus oil.

Patient discharged from hospital on Wednesday Jan 7th. The dressing was left on till Jan 19th when eucalyptus dressing removed. Smell of sublimate still distinctly perceptible in the abdomen.
abundant cotton which is of a yellow color and quite dry. The wound found nearly entirely healed. No bad smell remaining. A fresh, eczematous dressing was applied and this completed that care. The hand was some-what deformed owing to shortening of the 5th metacarpal bone.


Dec 4th. Keeping removed. Wound healed. Cicatrix over wounded joint firm and catgut stitches all absorbed. To the radial side of the line of the cicatrix is a surface of granulations extending on the surface facing
The bullet entered the forehead, the left side of the head. The wound was superficial and not as deep as it appeared. The bullet was small and had no serious injuries. It caused a minor scalp injury and was easily removed. The area was cleaned and a bandage was applied. The patient was sent home with no further treatment needed.
stretched considerably past the incision line. The right temporal bone was exposed and at two points the right parietal bone was visible.

1. There was a large lacerated wound of the right ear.
2. An incised wound of the scalp, 5 or 6 inches long, over the occipital region.
3. An incised wound above the left ear.

All these wounds were washed with corrosive sublimate solution (1:1000). The incised wound were closed by suture. Cutgut drainage was applied for the wound of the right ear. Sulfurized wood gauze was then put over all the wounded surfaces. Cotton wool was used as a top dressing.

Dec 5. First change of dressing. The posterior incised wound has healed by first intention. In the lateral wound over the right ear, some of the stitches have given way. There is gaping of the wound at two spots at the line of attempted union. Some pus is seen coming from this wound. The larger wound is looking healthy, but a good deal of bleeding occurred when the wood gauze was removed.
The fibres of the healing material seem to have become finely embedded in the vascular granulations.

About 20 grafts of frog skin were applied and covered up with small patches of green protective steeped in boric acid lotion. Over these came a layer of lint soaked in a saturated solution of boric acid. Top dressing of cots foam wool.

These grafts failed, Eucalyptus dressing, were applied and a healthy granulating surface obtained. A few grafts had survived and on Dec 15th the strong Eucalyptus spray was directed on the wound which had then healed with green protective steeped in eucalyptus and olive oil (1:5). This deeper dressing was well overlapped by absorbent cotton coming out of undiluted oil. Top dressing of cots foam wool.

Dec 20th Skin grafting

7 or 8 small skin grafts put on along the left margin of the large rounded surface and dressed with protective steeped in boric lotion towards the right side of the wound.
8 or 9 grafts under protective steps in sublimate lotion (1 in 2000).

Both the grafted areas as well as the remaining wound surface then covered with the eucalyptus and iodine ointment spread on a strip of iodine gauze. Top dressing of iodine wool.

Dec 24th

Redressed. Of the grafts treated with boric lotion only 2 or 3 appear to be growing. Those treated with sublimate solution are all growing.

Dec 30th

Many of the grafts failed. About 20 fresh grafts now applied. All treated with sublimate protective. Top dressing as before.

On Jan 2nd the dressings were carefully lifted and the grafts covered with fresh pieces of sublimate protective. Top dressing of iodine and eucalyptus ointment and iodine gauze all.

On the afternoon of January 9th the condition of affairs was as follows along the internal margin of the wound: 7 grafts are growing.
Case 24.1  Harriet E — I  (cont.)
Anteriorly over the right eyebrow there are 3.
On the right side, nearly opposite the parallel concomitant
a large graft is spreading beautiful white
pores free upward and downward. Along the
posterior margin there also 2 or 3.
All the edges of the wound surface are
spreading inward, and the area is much
less in size. The posterior part of the
temporal bone, formerly visible, is now
covered over by healthy granulation.
The incised wounds over the back of the head
and above the left ear, which have healed
by first intention, are now transformed
into two long lines of firm pinkish white
catarrh! The wound of the right eye is
also entirely healed.

Jan 9th  (afternoon)
Skin grafting again performed and dif-
frent deep dressings used for different
areas in order to compare results.
1. Posteriorly, towards the right
(side of the wound, 5 grafts under
protective gauze steeped in Sublimate Solution
(1 in 2000).
2. Just in front of (1), i.e. on
right side also, 5 under a small
fold of dry warm sublimate gauze.
In front of these 5 grafts under a thin layer of sublimated woodland gauze, protective.

In front of Y1, and grouped around a large growing graft, 5 grafts covered with small pieces of protective tissue from eucalyptus in olive oil (1 in 5)

Just in front of these, over the upper part of the right temporal region, 5 grafts under a dressing of eucalyptus and iodine ointment spread on fine iodiform gauze.

On the granulations over the left eyebrows 8 grafts put in position. To each of these a drop of pure undiluted eucalyptus oil was applied and then a dressing of iodiform and eucalyptus ointment on iodiform gauze as a covering.

All the dressings were then secured in position by folds of dry semi-sublimated gauze bandaging.

At the end of January, when I left Poing, the patient was in a condition to be discharged from hospital, but she was kept in the house because I understood my successor wished to graft again.

The following results had been obtained from the skin grafting done on Jan 9th:


(a) All 5 grafts took
(b) 3 out of the 5 grew. I seemed come off with delay
(c) 3 out of the 5 survived.

When the dressings were changed the first time the good grafts protective was again found adhering firmly to the subjacent granulation. Some of these were found torn and bleeding. Consequently the reconstituted granular tissue was replaced for the wound gauze.

(d) All 5 the grafts grew and soon coalesced with the larger and older graft round which they were grouped.
(e) 2 grafts grew.
(f) 5 out of the 8 grew. At the time of the first change of dressing not one was seen. Subsequently the grafts became seen to grow much more rapid by then any of those on other areas.

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Case 135: John R — at. 19.
Admitted Dec. 11. Injuries to right hand in machinery accident.

Front half of index, \( \frac{3}{4} \)inch middle, and entire ring finger excised to such an extent as to necessitate amputation.

Same day, amputation of injured part.

Large and deep wound in web of fingers, between index and middle, stiched up and sutured out with corrosive sublimate.
Sublime solution. Sutured wound of thumb also sutured.

A curtain of sublime gauze applied over all the three stumps and over the other wounds. This done with the hand submerged under the surface of a solution of corrosive sublimate (1 in 1000).

Dry sublime gauze over this dressing and it cover this again, thick folds of the Tech's salicylic coal. Drying secured by gauze bandage and left undisturbed for 4 weeks.

When removed the moistened sublime gauze was found to have caused such a great deal of irritation.

All the three stumps almost entirely denuded of skin up to the line of the meta carpo phalangeal joints and in some points the muscular covering also damaged. The flap covering the head of the 4<sup>th</sup> meta carpal bone was entirely destroyed and a deep gap between the base of the stumps of the middle finger and the little finger was the result. This gap was bounded on either side by bare bleeding granulation. The stumps of the middle and index fingers were without skin covering over more than half the extent of their surface.
At a point about the centre of the dorsal surface of the foetus, bone could be seen, while the extremity of the stump had only an imperfect covering of the granulations left! The end of the remaining stump — that of the index finger — showed quite uncovered bone surface at one point.

After all the exposed surfaces had been washed and irrigated with tepid boracic lotion, they were painted all over with pure undiluted turpentine oil and then a dressing consisting of iodine gauze steeped in eucalyptus oil in olive oil (1 in 5) was put on with an upper covering of absorbent cotton wool steeped in the undiluted oil. This dressing was left on for a week and when it was removed, granulation growth was seen to have advanced so quickly that the points were now covered. From all these surfaces where skin had been left undestroyed by the corrosive sublimate, cicatricial tissue growth was advancing over the surface of adjacent granulations. A similar dressing
to that above described was again applied.

The application of the pure undiluted eucalyptus oil by means of the enemai

bowl had caused no pain.

At the end of January, when I last

saw the case, the wounded surface

was almost entirely healed.

Case 36

Edward O. - at 42.

Admitted Dec. 15th. Injury to foot by

a heavy weight falling on dynamite.

This had caused a wound by which the

metatarsus phalangeal joint was laid open.

The joint was surgically cut and the

entire wound surface washed with corrosive

sublimate (in 1000). The edges

of the wound were brought together

by antiseptic stitches and a dressing

of abundant cotton wool wrung out of

undiluted eucalyptus oil was applied.

This dressing was left on for 22 days.

During all this time the odor of

eucalyptus pervaded the neighborhood

of the patient's bed. There was

no elevation of temperature at any

time. On the 23rd day the dressing was

removed. A small amount of dried up

blood and discharge was found in the

deeper layers, but there was no wound

ed
wounded surface — but even a single open granulation — left. A firm, healthy, pinkish-colored cicatrix existed where the wound had been. Outside this the ends of the catgut sutures were lying loose. The joint was somewhat stiff at first. The patient was soon after discharged, cured.

Cases 37, 38, 39

These three cases were admitted between Dec 15 th and Dec 20 th.

37. An adult male patient plus had both feet extensively scalded by a kettle of boiling water having been set on them.

38. A girl 8 years of age, who had met with a similar accident which had caused serious scalds of the face and of both arms.

39. A lad, aged about 15 or 16 years, with the hands and face scalded by burning paraffine.

Cases 37 and 38 were both subjected to ad'ministrin and in both a single application of the eucalyptus droping of once corrected the dist-gusting factor. After 5 days healthy granulating surfaces were exposed on removing the dressings and
and the absent cotton wool still smelt strongly of eucalyptus.

The case then progressed rapidly towards recovery.

In case 39, although there was great pain, the injuries were not so severe as in the other two. The hands were dipped into eucalyptus oil (1:5) on codeine paper, and an outer dressing of absorbent cotton wool made aseptic by having been immersed in undiluted eucalyptus oil. The face was treated with the soda solution.

The case was discharged from hospital cured in January.

Case 410, Frederick W. (41), admitted on Dec 8, and operated on on Jan 9th for right sided hip joint disease. He had been previously an inpatient, had been treated by rest, external, and had had internally the Syrup of the Sodite of Iron, the Compound Syrup of the Phosphates, and Cod Liver Oil. He had left the hospital in October 1884, then there were as yet no Siemens Fleming internally. But, before readmission in December, an abscess commenced
communicating with the diseased joint had formed and the pus had burrowed down the outer surface of the thigh, at the lower part of which the openings of two sinuses were now seen.

Excision of the diseased right hip joint on Jan. 9th 1886.

I made a posterior curved semilunar incision furred the posterior border of the trochanter major, divided the muscles and opened the capsule of the joint. The head and neck of the femur was found broken down and crumbling. All diseased bone was removed, the acetabulum cleaned and cleaned out the sinuses syringed out with 1 in 1000 and then plugged with strips of zinc sublimate gauze. The wound was syringed out again with corrosive sublimate solution (1 in 1000). The edges were brought together by several deep stitches and by a continuous fine antiseptic catgut suture. Mr. Ewing's modification of Neuber's drainage tube was inserted. Then followed further irrigation and washing with 1 in 1000 Dyeferg. Numerous folds of
dry 200 sublimated guaize (obtained from
Gale & Co., London, and made by Mr. Farquhar
of Edinburgh) were placed on the wound
and over these two thick pads of sublimat-
ed wood wool sewed in guaize bags. The
blisters draining were filled by bandages of the
200 sublimated guaize.
A weight of 1 lb. was found sufficient
to keep up eurhexion.
7 minutes of Dig Muriatic Acid chloridat-
with 7 minutes of Chlorodyne were adminis-
ted internally. This draught was repeated at
night.
At midnight the temperature was 99.4
At 4 a.m. on Jan. 10th. it was 99.2. The
patient slept fairly well all night.
Jan. 10th. 9 a.m. temp. 98.4.
Has taken his breakfast, consisting of
milk and beef tea, well. Is laugh-
ing and in good spirits. Does not com-
plain of any pain.
Afternoon — 2 p.m. restless and thirsty.
Says he has pain and is crying occa-
sionally. Tongue slightly furred and
pulse quick. Temperature rising.
At 7:30 p.m. temp. has risen to 103.
Patient has slept a little during the
afternoon, but occasionally has
cried out suddenly and started a-
wake
awoke with sudden sharp twitches of both arms and hands. The fingers are moving convulsively at intervals and the inner sides of the little est are grasped with a sudden spasm. The movement now and again. The patient then draws himself towards the upper end of the bed and brings his head backwards into the pillow. These movements were very marked after their first set at 7:30 and continued in a less pronounced degree till past midnight. The eyes were half closed, the eyeballs rolling and the pupils rather dilated. With the convulsive twitching described there were occasionally associated movements and twitchings of the lips. The fibers of the orbicularis oris muscle seemed to be contracting convulsively. These contractile were irregular in their time of occurrence and varied in duration from one or two seconds to half a minute. The corners of the mouth were also drawn downwards, now and then and the lower lip was occasionally retracted. Some of the muscles of the lower jaw were not altogether free from spasmotic contractions.
At 8.30 p.m. 7 grains of the Bromide of Potassium dissolved in water were given with a little syrup. An icebag was applied to the head. After 10 o'clock all the jerking movements and contractions above described, except those about the mouth, were decidedly less. Somnolence was more marked. It was with the greatest difficulty that the patient could be roused. He was lying with the head thrown far back and drawn upwards towards the very highest part of the bed. The eyes were only partially closed. The eyeballs were rolling and, at intervals, he gave a little short sharp cry. The temperature at 10 o'clock was 98.2°. The ice was kept to the head and at 10.30 7 grains more Bromide of Potassium were given. Later on in the night all convulsive movements gradually abated, after midnight the patient enjoyed quiet sleep and next morning (Jan. 11th) at 7.30 the temperature was found to be 98.2°. The little patient was very drowsy all that forenoon but later on in the day he brightened up and talked cheerfully. Towards evening there were some slight twitching movements.
Cases continued

Case 110 (Ferdy W. — continued)

of the hands and fingers. 7 grs. of the Bromide was then repeated. The application of ice to the head was continued.

At 8.15 p.m. (Jan 11th) the pupils were very dilated and there was some rolling of the eyeballs. The eyes were half closed. The head was thrown backwards and there were well marked twitching movements of the eyelids. The face looked flushed and the upper lip appeared thick and swollen owing to the great retraction of the lower one. The temperature was 100.6°.

A dose of the Bromide was again given and the ice was continued externally. After 10 o'clock the patient had a good quiet sleep all that night, all convulsive movements having ceased. Next morning the temperature was normal. There was no evening rise on the 12th. The patient was more cheerful and there was no return of any of the grave symptoms above described. The ice bag was continuously applied to the head for several days longer. No more Bromide was required and more
of the convulsive movements again appeared.

The temperature remained normal till the night of the 13th, when there was some rise and bad swelling, discharge was found coming through the dressing, which was therefore removed (under hot eucalyptus spray) and, after the strips of zero sublimate gauze had been taken from the sinuses, these latter were sprayed out with sublimate lotion. A eucalyptus dressing was then applied under the strong eucalyptus spray. The deeper layers consist ed of a strip of iodiform gauze steeped in eucalyptus in olive oil (1 in 5), the upper ones of the usual layer of absorbent cotton wool without any out of pure, undiluted eucalyptus oil and fixed by gauze bandage.

Next day the temperature was normal and continued so till the end of January, when I left the hospital. All this time the patient was in good spirits and his appetite increasing daily. The odour of eucalyptus was perceptible near the bed although the same dressing was
Case 41. Mr. G. 27-46.
Admitted Jan. 14th. Compound fracture of Tibia and Fibula. The patient was not sober when admitted and had been long addicted to excessive drinking.

The injuries were dressed with dry soft sublimate gauze after irrigation and thorough washing of the parts. Splints were applied and fixed by gauze bandage.

Symptoms of delirium tremens showed themselves three days after admission and the patient had to be laid down in bed to keep her quiet. Discharge was soon found soaking through the dressing. The wounds were found quite septic when they were redressed and the woman sank rapidly and died on Feb 22.

Case 42—1 May 2—Oct 26.
Admitted Jan. 16th. Compound
Fracture of Tibia and Fibula.
The eucalyptus dressing, as described in record of previous cases (with the undiluted oil on absorbent cotton wool) applied. No rise of temperature. Perfectly asleep, course till the end of January then the
Case ceased to be under my observation.

Case 43. Richard R. at 20
Admitted Jan. 16th. Bursts.

As there was abundant evidence
of there being a large collection
of pus in the bursa over the
Patella, the matter was evacu-
ated under a spray of Eucalyptus
(undiluted eucalyptus oil in the spray
bottle). The cavity of the bursa
was then well syranged out, first
with Tincture of iodine and
next with repeated injections
of corrosive sublimate solution
(1 in 1000). A drainage tube
was inserted and absorbent cotton
wool wound out of pure eucalypt
thus was applied as a dressing.

All this was done under the spray
above mentioned. The drainage
tube was removed under eucalyptus
spray two days later and the same
dressing was applied from
sterile prepared materials. By
the end of January the small
wound was entirely healed and
the bursa was cured.

Case 44. William A.
with three fingers crushed in machine.

Injured fingers removed by amputation, Eucalyptus dressing.

Healing process rapid and without irritation.

A review of the cases above recorded will show that they were:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amputations of Leg</td>
<td>2</td>
</tr>
<tr>
<td>&quot; Thigh</td>
<td>1</td>
</tr>
<tr>
<td>&quot; Forearm</td>
<td>1</td>
</tr>
<tr>
<td>&quot; Upper arm</td>
<td>1</td>
</tr>
<tr>
<td>&quot; Lower</td>
<td>6</td>
</tr>
<tr>
<td>Excision of Hip Joint</td>
<td>1</td>
</tr>
<tr>
<td>&quot; Mammary</td>
<td>1</td>
</tr>
<tr>
<td>Debridement for Gland Tumour</td>
<td>1</td>
</tr>
<tr>
<td>Removal of Carious bone from</td>
<td>1</td>
</tr>
<tr>
<td>&quot; Calcis</td>
<td>1</td>
</tr>
<tr>
<td>Antiseptic evacuation of pus</td>
<td>1</td>
</tr>
<tr>
<td>from Pusca Patella</td>
<td></td>
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<tr>
<td>Compounded Fractures</td>
<td>5</td>
</tr>
<tr>
<td>Deep Abscess</td>
<td>3</td>
</tr>
<tr>
<td>Burns &amp; Scalds</td>
<td>6</td>
</tr>
<tr>
<td>Wounds (incised &amp; lacer. not into small joints)</td>
<td>5</td>
</tr>
<tr>
<td>&quot; involving small joints</td>
<td>4</td>
</tr>
<tr>
<td>&quot; Hand with foot</td>
<td>1</td>
</tr>
<tr>
<td>(compl. of metast. bone)</td>
<td></td>
</tr>
<tr>
<td>Ulcers of Leg and Foot</td>
<td>4</td>
</tr>
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</table>
The above is a record of all the antiseptic work done at the King Edward (Dispensary Hospital) during the months of May, June, July, August, September, October, November, and December 1884, and during January 1885, i.e., during the last nine months of the period of my House Surgeonship.

It is an imperfect record (not being full enough) but unavoidable so, for the large amount of additional work I had to attend to in the out-patient visiting department engrossed on the time I had at my disposal for note-taking.

In cases 1, 2, 3, 4, 5, 6, 7, 8, and 17, Carbolic acid was the antiseptic agent employed. In all the other cases given, with the exception of one or two in which iodiform was used, the antiseptic was either Eucalyptus oil or corrosive sublimate or both.

Of the cases above referred to, as having been treated by Carbolic Acid dressings: Nos. 1, 4, and 5 were the only ones in which the Carbolic Acid spray was made use
use of. In Case 5 the original Lister\'s\n\n\ndressing was applied both at the\ntime of operation and subsequently.
\nIn Case 4 a eucalyptus dressing\nwas substituted on the third day after\nthe operation.
\nIn cases 1, 2, 3, 7, 8 and 17\nthe method of dressing advocated in\nEdinburgh by the late Duncan\n(Edinburgh Medical Journal 1882-1883)\nwas employed. Drenching by means of\ncarbolic acid in glycerine took the\nplace of the ointment and the dressing con-\nsisted of a 1.5% solution of carbolic\nsteeped in the carbolic glycerine and\napplied to the wound, with a cover-\ning of Thierversch's dry salicylic wool\n(white or without an intermediate layer of\nmint carbolic gauze) well overlapping\nit on all sides and fixed by\n\n\ngauze bandages.

I have given the notes of these\ncases because their history belongs to the\nsame period as that of my other cases\nfrom which they cannot therefore be\nconveniently separated. The work I\nhave set before me, however, is\nto pass in review those cases which\nwere treated by eucalyptus and
Corrosive Sublimate's effects and to state the results I have obtained by using these two antiseptic agents.


With the exception of Case 4, the first case in the list in which the oil of Eucalyptus was used is that of Mr. B. (no. 6). Though both the malady from which this patient was suffering and the operation resorted for its relief would have been exceedingly trying under ordinary circumstances, they were by no means so in this case. The advanced age of the woman, combining with a very debilitated constitution and a severe attack of bronchitis also supervening, made the case much harder than before the operation. As high evening temperature and almost complete anorexia showed the invades which were being made on the patient's already reduced system by the causally missed chest being left unremoved, the operation was at once performed and the patient's general health condition improved im-

mediately.
immediately after the had been done. Deep and rapid aseptic union and not the slight cut irritation were the objects attained by the use of the eucalyptus dressing in this case.

The case of Mrs R. (no 9) is the next on my list in which these dressings were made use of. Its history and that of other cases to be subsequently referred to, convinced me of the great value of the oil as an external application in burns and scalds of any magnitude, where a large skin surface has been entirely or partially destroyed and where, as a consequence, there is extensive sloughing.

(1) The high antiseptic power of the oil effectively counteracts fermentative and putrefactive changes.

Ieers (Over de werking van Eucalyptus Globulus - Leiden in Groningen 1873) and Degen (1874) found the relative power of Eucalyptol and Muriate of Bismuth in arresting and preventing Alcoholic fermentation. According to the former a 2% solution of Euc. oil to altogether prevent the fermentation, while a stronger solution
of matters of Quinine cannot do it. From this it is evident that, having added 0.91 gram of Eucalyptus to a mixture of yeast and grape sugar in 180 grams of water, he could obtain no Carbinic acid at all from the mixture 2 hours afterwards. From a similar mixture treated with Quinine in similar proportions, he got 108 cc. of Carbinic acid. This showed that alcoholic fermentation had been prevented by the Eucalyptus but not by the Quinine. (Archiv für Experimenterelle Pathologie u. Pharmakologie 1875, Band 4.)

In a nutritive fluid in the proportion of 1:666, present altogether the presence of bacteria, Carbinic acid and Quinine, Bucholtz found had to be present in as high a proportion as 1:200 in order to effect a similar result. Schulz also (Das Eucalyptusöl. Pharmakologisch und klinisch dargestellt. Born 1887, p. 245) has shown the superiority of Eucalyptus oil as an antiseptic over Carbinic acid.
Not only as an antiseptic, but also as an agent which checks or arrests local tendencies to inflammation and which diminishes the formation of pus, is eucalyptus oil of service. *Moes* of Leyden, exposing the mesentery of a carassaid frog to vapor of eucalyptus and inspecting the result under the microscope, found that diapedesis of white blood corpuscles was checked, that the corpuscles came to retract their processes, assumed a round form and became stationary under the action of the vapor and that in this way inflammatory changes were prevented in the exposed mesentery. Even 48 hours after commencement of the experiment there was no inflammation. (Cf. *de Wetering van Eucalyptus Globulus*).

In working with eucalyptus, nothing is more noticeable than that power which the oil possesses of resisting the amount of pur secretion and producing a clean wound surface. Apart from its two properties above named, eucalyptus oil has
a direct action in promoting granulation growth. This is probably due to its local stimulant action (Schultz). The eucalyptus spray which I employed in Case 9 and in other cases was obtained by means of an ordinary spray producer with pure undiluted eucalyptus oil in the spray bottle. The vapor of emulsified eucalyptus thus obtained is too irritating when inhaled ever to make it pleasant to work with. Even the spray obtained from a solution of eucalyptus in rectified spirit (1 in 5 or 1 in 8) shares this disadvantage.

Case 10 showed me that not only in superficial wounds but also in large deep ones the oil is a reliable and trustworthy antiseptic. Beautiful primary union was here attained in the case of an old man and the absence of all inflammatory processes and violeth in the course of care of this large wound gave me a clinical demonstration of what Mees brought out by experiment on the frog.

Case 11 showed nothing remarkable.
Observations on Antiseptic Work with Eucalyptus Oil (continued)

What has been already said about the results obtained and the observations made in case 9 are applicable also to cases 12 and 13.

In case 14 Iodoform was used with eucalyptus.

The cases intervening between 14 and 30 were all treated by sublimated dextrose.

It is with the employment of eucalyptus with skin grafting that I have now specially to deal. I shall state what I learnt from cases 30 and 31. When I had had occasion to perform skin grafting in cases previous to the two here referred to I had followed the directions of Professor Lister (Lancet June 1875, pp. 781). The grafts had been covered with pieces of green protective linen which had been steeped in boracic lotion (1 in 40) to make them aseptic, and over these bits of antisepsis the protective dressings came, a layer of boracic lint—the lint being taken out of a saturated solution of boracic acid. But I had then covered these upper dressings with...
another layer of lint or gauze, on which an
ointment of eucalyptus was spread. These
superficial dressings over the grafted areas
were in these cases in which they were
used, continued over the ungrafted space
of the wounded surfaces. As I could
not help noticing the superiority of
Eucalyptus over boracic acid both as an
antiseptic and as a preventer of germa
nation growth, I came gradually to change
my method of dressing skin grafts.
In cases 30 and 34, which were
in the hospital at the same time,
I first abandoned the boracic acid
for skin grafting. I used Boracic
sublimated and Eucalyptus instead.

Of the numerous grafts which I
applied in cases 30 and 34 at
various times and dressed by means
of Eucalyptus (some were applied
under pieces of green protective
material, some were applied
steeped in Eucalyptus in olive oil
1:1:5), the upper dressing consisted
of an ointment of Eucalyptus alone
of Eucalyptus and Boricaine. Others
were immediately after they had been
applied, touched with a drop or so
of the undiluted oil, and then
dressed as above, or without any
protective
Skin grafting

protective, that is to say, merely with
the ointment of eucalyptus and vaseline,
or eucalyptus, iodine and vaseline,
spread on Eit or gauze. The best results
were got from the first mentioned method. If
the surface to be grafted did not show a sufficient
amount of healthy granulations and if it was
thickly coated with pus, it was first dressed for
a day or so, or for a longer period if necessary,
with fine gauze steeped in a solution of eu-
calyptus in rectified spirit (1 in 5 or 1 in 8).
By this drying a healthy looking granulat-
ing surface free of pus can soon be got. To
get the grafts are then applied. It is best
to cut small pieces of skin by means of the
skin grafting scissors, then to place them
on the nail of the thumb (the hand of the
operator having first been well washed) in
a eucalyptus solution or other antiseptic
and divide them into smaller pieces by
croft excision with a small thin bladed
sharp knife. It is not necessary to have
larger pieces of skin for each graft than
about the size of a pea's head; but if the
supply is obtained from the foot, one
as a rule applied much larger pieces,
because any amount of grafts can then
be got without difficulty.

Being careful to get the right
side.
Skin grafting

Side uppermost, one lifts the little graft on one side of the blade and projecting over the edge of the knife. The other surface of the blade is then drawn gently across the field of granulations. The projecting portion of the graft is by this manoeuvre caught on some prominent granulation and the entire graft drawn from off the surface of the blade of the knife, which is made to slide away from under it. As the graft may be applied by means of the dorsal forceps. After being put in position it is then immediately covered with a small piece of sterile tissue which has been immersed and kept ready in eucalyptus and olive oil (1:4:5). The outer dressing is applied after all the other grafts have been put in position and covered in the same way as the first. It consists of a mixture of eucalyptus, or 1 of eucalyptus and iodine, spread on fine iodine gauze and covered by abundant folds of dry iodine for eucalyptus gauze. This dry upper dressing is of service in absorbing all discharge and keeping the wound aseptic. So long as this can be effected, it is best to leave a dressing thus applied for at least 5 or 6 days.
days before changing. At the end of that time there is little chance of pulling off the grafts. This accident can hardly be avoided if the first dressings be disturbed too soon. At the end of 5 or 6 days the dressings are lifted carefully and the pieces of protective cloth are taken away with them. The surfaces of the wound must now on no account be wiped or touched, for then some of the grafts are almost sure to be wiped away altogether or partly torn off. A perfectly aseptic sponge, or some absorbent cotton wool, is steeped in a lotion of eucalyptus in rectified spirit (in 5) to which some tepid water has been added or in a solution of corrosive sublimate (1 in 2000) or boracic acid (1 in 200), and then gently squeezed out over the surface where the grafts are, so that the stream of antiseptic lotion can very slightly trickle out and wash away any pus that may be there. After having been carefully washed in this way, the wound is then redressed (the grafts) surfaces being covered with a protective as before. The time of subsequent dressings is fixed by the appearance of the parts. Eucalyptus oil is one of the best
best antiseptic agents to apply over skin grafts because of its power, already referred to, of promoting granulation growth, and thus fixing the graft firmly, and of counteracting pus formation. For this interferes with the success of skin grafting, by washing away the grafts before they have had time to adhere firmly.

Where I grafted with eucalyptus, I got more rapid spreading of the grafts than where I used sublimate or boracic dressings.

The proportion of grafts which took was higher with eucalyptus and sublimate than with boracic dressings.

The remaining cases in which I employed this antiseptic agent in the dressing were 32 (in part) 35 (in part) 36, 37, 38, 39, 40 (in part) 42, 43, 44.

In 32, 35, and 40, sublimate dressings were also used.

Besides the advantages of eucalyptus, in some cases, there are two points chiefly illustrated in the histories of these 10 cases. The one is...
is always an advantage in a surgical dressing via. freedom from irritation. The oil is an advantage in some respects only. It is volatility.

1. Freedom from irritation.

In the case of the little girl Harriet (Case 34), where there was a large open surface of bone sensitive granulations, the pure undiluted oil was used in small quantity to touch some skin grafts with. No pain or discomfort was complained of. Case 35 was one in which a long continued application of moist sublimate gauze caused such an amount of irritation as to destroy extensive skin surfaces. Nor did the deeper coverings of the stumps escape this caustic action in some parts. The bare raw surfaces of the wounds were here also painted with the undiluted oil and then deepened with that diluted 5 times with olive oil. The result is noted in the history of the case. The application of the pure oil caused less pain.

In cases 36 (open wound of metatarsal phalangeal joint), 43 (Purpura), and 44 (amputation of finger) the above cut cotton wool steeped in undiluted oil
oil was applied direct to the wound. There
was, in these cases, no immediate
dilute eucalyptus drying. No pain
or irritation resulted.

The strong eucalyptus spray obtained from
using undiluted oil in the spray bottle was
directed on large wounded surfaces, as for
example in the case of Mrs. R. (Case 91),
without causing pain or irritation beyond
some slight amount of smarting at the time
of application. Ordinarily the oil
was used diluted in olive oil (1:5)
for that part of the dressing immediately
in contact with the wound. Never did
the remedy thus diluted cause either
pain or irritation to the wounded
surface. On the contrary the results
obtained seemed to show that Meas
proved by experiment on the frog,
moi that eucalyptus oil has the
special power of counteracting and preventing
inflammation locally, by checking and
arresting disintegration of clots, blood
cells.
The outer layer of our dressing
generally consisted of absorbent cotton
wool, coming out of the undiluted
oil, and covered by bandage. These
layers of the eucalyptolised cotton wool
had to project far beyond the deeper depth
of the eucalyptus decoctions, and therefore, they
were by necessity in contact with the skin
of the patient. I have not seen irri-
tation of the skin arise from the use
of decoctions thus applied.
The oil employed was obtained
from Gay and Co of London, was
well matured (at least 2 years old)
of a yellowish color, and had no trace
of odor at all resembling that of the
tincture of eucalyptus. Other speci-
mens of oil which I have seen and which
were obtained from other sources, was
of a greenish (instead of yellowish)
color and their odor in some degree
resembled that of the Tincture of
Eucalyptus. According to Schulz,
such oils are inferior ones because
they are too fresh for use. Before
oils of this description can be used
either internally or externally, they
have to be exposed to sun light and
air for some time, in order to get
rid of numerous crude products-
irritating substances which exist in
the leaves of eucalyptus along with
the oil.
It may be also that many of
The oils in the market are not obtained exclusively from Eucalyptus globulus. Eucalyptus amygdalina, e.g., may serve as an adulteration (Schulz, 1931, p. 14), and some of the other eucalyptus species may contain more of those matters which cause irritation to wounds or to skin surfaces than Eucalyptus globulus has in its leaves. Other impurities also, such as some of the terpenes, may be present in oils sold for Eucalyptus globulus.

These possibilities being held in view, one can easily understand how some observers have chronicled irritation as a result of eucalyptus dressings.

Irritation of the skin does, however, undoubtedly occur, even when the purest varieties of oil are employed, if the dressing is made altogether impermeable to air by a tar, linseed, or some similar material. Schulz has shown by experiment on himself (p. 50–53) that both the unripe fresh oil and the purified oxygenated variety cause irritation.
irritation of the skin, where applied in a dressing from which air is entirely shut off by an envelope of moist parchment paper (Aedensis Verband) but that the amount of irritation is less with the oxygenated oil than with the fresh.

He prepares this oil for use by treating first with soda solution and subsequently exposing it to air and light. In this way he charges it with oxygen and gets it to undergo the changes which produce the pure mineral variety.

In Professor Pansch's clinic at Rome the oil thus prepared was applied—painted or pencilled on—in the undiluted state to wound surfaces in 20 cases. No pain was caused. "Schmerzlaut" says Schutz, "war die Application des reinen, unverdünnten Öles in keinem einzigen Falle, selbst nicht bei einem kleinen etwa 2 Jahre alten Kinde, das sich die Bepinselung einer größeren, nach Frakturplastik einer Deltahemothorax resultierenden Wunde ganz ruhig gefallen ließ."

(2)
(Volatility)

In my cases 32 and 40 the sublimate dressings were changed for eucalyptus because a volatile antiseptic seemed indicated. It often occurs that one derives a constant action of a volatile antiseptic on a wound which is already to a greater or less degree protective although the healing process is far advanced. The two cases referred to may be taken as illustrations in point. Spraying with antiseptic lotions under such circumstances always does some amount of harm, by breaking up union which has already taken place in part, and even were it possible to spray out a wound with corrosive sublimate or some other antiseptic lotion without at the same time causing any disturbance to the healing process, the fluid would not perhaps penetrate to all corners and crevices, where an antiseptic vapor constantly applied would find its way. Antiseptics which volatile at the temperature of the human body are specially indicated under such conditions. Eucalyptus oil, being non-poisonous and non-irritating when
Observations on Antiseptic Work with
Eucalyptus Oil. (continued)

(2) Volatility. (continued)

When lightly heated and when free from impurities, and possessing greater germicidal powers than carbolic acid, occupies a high place on the list of volatile antiseptics.*

Besides having distinctly higher direct germicidal powers than carbolic acid, as was proved by the laboratory experiments of Buchheit and Schulz already referred to, it is perhaps not only possible but probable that eucalyptus possesses an additional indirect antiseptic action in its remarkable

* The way pointed out above, i.e. by pouring off a cloud of vapor into all the woundings and sinuosities of a wound cavity, volatile antiseptics may be said to be penetrating in their action. But this is an additional sense in which the term penetrating may be employed for it is believed and taught by some high authorities that the volatile antiseptic agents diffuse the non-volatile ones in carrying their action beneath the surfaces of wounds; in other words, the volatile antiseptics penetrate some distance into the tissues and do not merely confine their influence to superficial parts.
remarkable power of stimulating healthy granulation growth, thus increasing the vitality of the tissues. The absence or diminution of pus, which is characteristic of the appearance of wounds treated by eucalyptus applications, also indicates increased vital action — absence of dead and dying tissue elements. Increased vitality means increased resistance to modifying influences, for germs cannot live on healthy tissue.

It is perhaps in this indirect way that eucalyptus exerts its chief antiseptic action. It not only kills germs when brought in contact with them, but also stimulates the vitality of the tissues to such an extent as to cause increased resisting power and thus prevents the origin of a niche for the reception of germs.

As a volatile antiseptic, eucalyptus oil has its advantages, but the great disadvantage, which it shares with other volatile antiseptics — the difficulty of preparing desinfegrants with it to suit all cases — must not be lost sight of. This drawback has been lately referred to by Professor Diller in his address to the Medical Society of London on Curare: 'Sulphur as a surgical dressing.'
(Moist Eucalyptus dressings.)


A dry volatile antiseptic dressing, such as the eucalyptus gauze is in danger of losing its antiseptic power, from the material with which it is impregnated passing off in vapor. Great care must therefore be taken, not only that such dressings are carefully preserved in closed antiseptic boxes and in a cool place, but also that their preparation be faithfully executed. In most of the German hospitals where eucalyptus dressing are used they are prepared by the surgeon himself or by his Chef de Clinique.

The problem of how to obtain an antiseptic dry absorbent dressing is easy if solution in the case of corrosive sublimate and other non volatile substances but exceedingly difficult when eucalyptus oil comes to be the agent employed.

Most dressings, consisting of gauze charged with the oil diluted in various proportions, have been much used on the Continent. But
the adsorbing power of a moist dressings is low. Hence where such an amount of discharge of blood or serum is expected as would soak the dressings to any large extent (as after major amputations, e.g.) and where at the same time a first dressing is required to remain in situ for some considerable time a moist dressing of eucalyptus is out of place. On account of its volatility and other advantages already referred to, this antiseptic should be chosen and applied in the form of a moist dressing that this must be changed for a fresh one if possible before the blood or serum has soaked through, or at any rate, as soon as discharge is noticed beginning to come through.

In the case of any eucalyptus-gauze dressings, a high absorbing power is available, but their employment always brings with them the risk of failure of antiseptic power (on account of the volatile nature of the oil) unless their preparation and preservation has been sufficiently attended to.
to.

The moist dressings, which I used and have described in the history of the cases, differed from the moist eucalyptus dressings recommended in Germany in having only a thin curtain of gauze (with dilute oil on it) to cover the wound itself. The rest of my dressing consisting of absorbent cotton wool (instead of gauze) charged with undiluted oil. In one or two cases the deeper dressing was dispensed with altogether. A further outer covering of salicylic wool or some other dry absorbent antiseptic dressing material is of course necessary in many cases.

To sum up, with regard to the place of eucalyptus in antiseptic surgery:

1. Its germicidal powers are high—three times as high as those of carbolic acid according to Bachofen.

2. Possibly apart from its being directly poisonous to germs it exercises a further antiseptic influence by creating...
Summary

Increasing tissue viability through
3. its power of countering pus forma-
tion and inflammation by checking
diapedesis of white blood corpuscles
and through
4. its property of promoting
healthy granulation growth.

5. It is a volatile antiseptic and
therefore specially characterized
by penetrating antiseptic action
on wounds. The vapor, given
off at the temperature of the
body, keeps the wound surface
constantly bathed in antiseptic steam.

6. It is a non-poisonous
antiseptic
7. It is non-irritating. When properly
employed and when free from
impurities. Even the undiluted oil

* The effect of large (poisonous)
doses of eucalyptus oil internally may be
summarized by saying that it acts dele-

tiously on the central nervous system.
The spinal cord being principally
affected; that with this depressor
action on the spinal cord there is
associated
oil, so long as it is pure, can be painted on wound surfaces without causing the slightest pain.

(8) It causes no damage to instruments.

(9) It is perhaps the best of all known antiseptics to apply in the treatment of burns and scalds and large burned surfaces where much skin has been destroyed. It is of special use also in healing skin grafted surfaces.

Associated with a consequent slowing of the heart's action and of respiration; and that this again leads to accumulation of carbonic acid in, and deficient oxygenation of, the blood. The blood of animals poisoned by eucalyptus oil is dark colored and presents all the characteristics of venous blood.

Perhaps, therefore, it becomes important in practice to consider what will be the effect of rather large doses internally or of considerable quantities of the oil applied externally to large wounded surfaces for a long time.
Continued period. Is there risk of causing
death of the foetus in utero by applying
eucalyptus douchings to large absorbing
wound surfaces in the pregnant female?

I have very short notes of the
following case:

Mary J. — unmarried — 36
admitted to Penny Dispensary Hospital (In-
firmery) on October 13, 1884 for
severe diffuse eczema.
The skin affection was on every part
of the body. The face, hands, arms,
delant, back, abdomen, legs and
feet were all involved — Eczema
impetiginous and Pustum were
the two most prevalent varieties.
The patient was in great misery
and gave a history of very sudden
onset of the disease. Pregnancy
was not suspected.

Eucalyptus douchings applied on
some parts to stop the excessive fuss
formation and counteract the toxic
factors towards inflammation. Glycerine
and oxide of zinc used on other areas.

Better results were soon manifest
from the eucalyptus than from the
other douchings. The oil was
rubbed in place and undiluted all
over.
over the arms. On the back and face dressings of eucalyptus in olive oil (1/2 in. ½) were applied. After 14 days all dressings were abandoned and pine oil of eucalyptus was daily rubbed over all the permeating surfaces except the face, which was dressed with bismuth salve and made of zinc. This treatment was continued till December 27th when the eczema had nearly entirely disappeared from all parts of the body (leaving a clean, red, skin surface except the face).

On Dec 27th patient complained of not feeling well. Loss of appetite and sickness.


Dec 29th. Intense pain in head. Vomiting. Temp. 104°

Dec 30th. Pain in head. Vomiting. Morn. t. 103.2 ev. 103.2

Dec 31st. Left pain in head. Morn. t. 102.6 ev. 103.6

Jan 1st (evening). Labor pains with expulsion of anterior uterine portion.
febric (4 mos.) 1. High temp.

Further attacks - Syncopal or fainting

Cough: Fluid, or severe after pains.

Lethargic breathing. Pain on chest.

Some haimoptysis - Pallor.

Diminution of breath internally in large doses.

Jan 2 - Severe symptoms con-
tinue. Delirium and high
temperature readings follow.

Death occurred on Jan 5 -
(6:45 a.m.) preceded by symptoms
of pulmonary embolism.

At the Post Mortem exami-
tion, which was conducted
by Dr. C. McLaren, (P.S. 1),
were found

(1) Extensive pulmonary

embolism of right lung

(2) Signs of inflammation

of peritonitis.

(3) A large soft, pulpy

adves mass filling nearly

the ventricles of the spleen.
In this case there was no syphilis, injury or other cause which could account for the abortion.

I believe, however, that the long continued use of much eucalyptus oil externally may have led to such an amount of absorption into the blood of the mother as to have caused death of the foetus through deficient oxygenation.

After death of the foetus in utero followed septicemia and abortion.
Corrosive Sublimate

Observations on Antiseptic Work with it.

The cases numbered 15—35 (with the exception of case 17) and cases 140 and 141 were all dressed with Corrosive sublimate. Some of them however, were only treated with sublimate dressings for a time and subsequently had laudanum applied. Those which were treated with 1st antiseptics were 15, 16, 22, 30, 32, 34, 35 and 40.

The twenty-two cases now to be passed in review were

2 Compound Fractures of the Tibia
   1 " " Tibia & Fibula

3 Major Amputations
   2 Minor "
   1 Excision of the Hip Joint
   3 Ulcers of Leg and Foot

2 Deep Ulcers (Foot & Hand)
2 Wounds (Incised & Lacerated) of Hand
3 Involving Small Joints
   1 Hand Injury (Wound & Crush, etc. of metacarpals)
   1 Lacerated Wound of Upper and Forearm
   1 " " Scalp

22
At the operation, irrigation with sublimate
lotion (1 in 1000) was used, but never
continuously. Even irrigation repeated at
intervals during the course of an operation
was found to cause damage to incisions.

Immediately after operations, when
stitches had been inserted and everything
was ready for applying the dressing;
the wounds were invariably syringed
out, at least two or three times, with
the solution.

In the after dressing of cases irri-
gation was kept up continuously or
the eucalyptus spray was employed
from the commencement of removing
the old dressing till the field dressing
covered the wound.

It is easy enough with dry abradent
sublimated dressing to keep a case
aseptic till the time of the
first change of dressing—even
although that may be a fortnight
or even three weeks after the opera-
tion. So long as the dressing is
a thoroughly efficient one, both as
an antiseptic and as an absorbent
application, there can be no infec-
tion of the wound from without.
for the discharges will be kept from communicating with the outside air.

If in the old dressings have to be removed and fresh ones applied that difficulties occur. Unless irrigation can be kept up continuously in every part of the wounded surface, there is risk of infection from bacteria. For in the dressing on that wound surface germs will now find a nidus. At operations on healthy tissues this cannot occur and it is sufficient here to irrigate thoroughly all the wound surfaces after they have been made safe by syringing out the cavity of the wound with antiseptic solution.

After the after dressings syringing cannot be resorted to for fear it would be the risk of breaking up union, which has already occurred or which is just taking place. Either irrigation by antiseptic solutions or the spray must be employed.

The question is:

1. Can antiseptic irrigation be effective if applied in all cases with the means at our disposal?

or again?
(18) Is the spray an efficient germicide? Or at any rate, does it interfere sufficiently with the vitality of germs to prevent their doing harm to the wound?

(19) I shall confine my remarks to corrosive sublimates.

Without doubt, if, instead of using watery solutions, the sublimate in question were to be always employed, constant irrigation would be made easier and more efficient. The former at once flow over the wound surfaces and whilst one side is being irrigated the opposite one may be exposed to the air — unless the rose of the irrigator be a very large one or the stream be running from a great height and consequently by the action of gravity, propelled with greater force.

An improvement on the existing irrigators for antiseptic solutions would not be out of place. The rose in everyone of those we have now seems too small and the fluid does not get divided and spread out over a large ground.
enough surface.

Submersion under the surface of an antisepctic solution is manifestly inapplicable in some cases; and even where it can be carried out it is open to the objection of interfering with the healing power of the dressing by necessitating the application of a moist deep curtain of gauze or similar material. In the case of sublimate dressings this may cause serious damage to the parts by the great amount of irritation it gives rise to, as Green, for instance in my case of John R— (Case 35—). When, however, instead of employing the watery solutions of corrosive sublimate, we make use of this antisepctic in glycerine (1 in 1000) then irrigation by means of a large deep syringe is comparatively easy. This is a method I have lately had opportunity of seeing at work in Prof. Forwood's wards of the Royal Infirmary. As the sublimate dressing is being lifted from the wound, the surgeon who is in charge of the syringe...
filled with the antiseptic drops a small quantity on the successive wound surfaces which become exposed. The material is so sticky and glutinous that it adheres to and covers the wound, without running off from it in the way the water solution does. By that time the part of the wound last requiring the attention of the surgeon has been cleansed of debris and covered with some drops of the sublimate and glucine; the parts first exposed are still protected by the antiseptic which has been applied to them. The fresh dressing is reapplied without the disadvantage of a superfluous amount of moisture which is difficult to avoid when irrigation by water solutions has been resorted to.

18) The question of the efficiency of the spray as an antiseptic agent seems to be unsettled.

With regard to the necessity of its employment—supposing it to be an efficient antiseptic—during operations on healthy tissue, the opinion of
of modern leaders in surgery (excepting Laparotomists *) seems to be getting almost unanimous in the negative. A freshly made wound surface through healthy tissues presents no soil for bacteria—no soil in which they can take root. Hence irrigation and syringing with antiseptic solutions, immediately after opera-
tions are now thought to be sufficient. In the after-drying of cases that are left to drain.

A great many eminent surgeons in Germany have discarded its use altogether, accepting the results of Lister's experiments and observations as conclusive. In Edinburgh also dry, absorbent, non-volatile dressings have been extensively employed of late. To the teaching of Dr. John Duncan Gems and the Spey.

* In abdominal surgery decided opinions prevail—some operators using the sponge with the object of preventing bacteria getting to the exposed peritoneal surface alive. Others operating without it because they have come to dread cardiac and peritoneal infection.
Edinburgh Medical Journal March 1883, be accepted as the carbonic acid spray in 1883 and even beneficial in certain cases (p. 783). "I should think it likely to prove more injurious than beneficial in such cases" and what follows... but results apparently diametrically opposed to those of Dr. Duncan Shade... the greatest benefit... (Transactions of Medical Chirurgical Society - August).

But supposing it to be absolutely and certainly determined that the carbonic spray is not efficient in preventing gases from causing mischief to wounds, then if what have we to replace the spray? Is irrigation an effective and efficient antisepctic procedure under all circumstances?

This question has been dealt with above.

2) If the spray fails, why does it do so? When the answer to this question is known, we may perhaps remedy the defect.

The fact of gaseous being swept rapidly through a cloud of weak carbonic acid vapor (1 in 40) does not kill them. It causes them in greater quantity on a wound surface than when they fall on a wound...
wound from an unsprayed atmosphere.

Then why not increase the strength of our antiseptic vapour? Why not put a higher proportion of antiseptic in it? This can easily be done by substituting another antiseptic agent for carbolic acid.

Eucalyptus oil has three times the germicidal power that carbolic acid possesses. (Botelho)

A eucalyptus spray obtained from a solution of 1 part of eucalyptus oil in 10 parts of rectified spirit and therefore giving a proportion of eucalyptus to vapor of 1 in 20, would have six times the direct germicidal action that the ordinary carbolic acid spray gives. So this figure of 6 would have to be further added some amount of antiseptic action which the alcohol would give.

But much stronger eucalyptus sprays can be employed. I have worked with the sprays obtained from 1 in 8 and 1 in 5 solutions of eucalyptus in spirit and even with the emulsion spray got from undiluted oil.
The use of even the strongest eucalyptus spray will cause no harm, so long as he can accustom himself to the discomfort caused by breathing the vapor. Eucalyptus is non-poisonous and non-irritating to wounds, and as it possesses much higher germicide power than carbolic acid, it is possible that the cause of failure with the spray may be overcome by substituting the eucalyptus oil for carbolic acid.

The sutures used in the cases recorded were in most cases the sulphurous acid catgut, for superficial, and subcutaneous suture for the deep stitches. The sulphurous catgut was obtained from Wood & Co. (Manchester). I confess such an amount of irritation that sublimated catgut was afterwards substituted.

Whether this irritation was due to some chemical change occurring owing to the presence of the sulphurous acid with the perchloride of mercury, or whether the sulphurous acid and catgut stitches alone were...
to blame I cannot say.

Itch abscesses were of frequent occurrence when these sutures were used. It may be that the great preservative power of the exosorcin ointment came into play on the sutures themselves and prevented their being absorbed.

Case 22 (Sarah L.) may be taken as an example of the evil referred to.

The case was one of amputation of the forearm which I performed on September 10th 1884. The dressing was not disturbed for three weeks after the operation, and the patient was discharged from hospital after a second dressing had been applied, with the stump to all intents and purposes entirely healed. At least there were only one or two bare granulations left. These two little points, however, obstinately refused to heal, and standing prolonged treatment in the out-patient department with the ointment of eucalyptus and iodine, even weeks after the operation, a piece of wounded hard cutage, which was the cause of the irritation, was removed and rapid
rapid healing of the little wound followed. The same point is illustrated in the case of Mary Ellen H — (Case 27) where the sulphuric acid irrigant stitch caused a great deal of irritation which led to suppuration at the points affected.

With regard to deep sutures, (stitches of relaxation) thick unlimoted silk was used. In one case, (that of the Mr G, Case 28) an amputation of the thigh which I performed on the same day as the amputation of the forearm (case 272) above referred to, I made the mistake of removing these stitches too soon. In that particular instance the mistake was in putting in too few superficial sutures at that time of the operation, the edges of the flaps, therefore, not being brought well together. The result was that when the deep stitches were taken away, the long anterior flap became separated from the retracting short posterior one. This had to be remedied by again introducing the deep sutures on the side of the thigh.
The ligatures used for tying small blood vessels were generally of sulfuric acid and cutout. Sometimes a sublimated cutout was used for larger blood vessels. Sublimated silk was employed.

A point to which particular attention has to be paid in dressing with corrosive sublimate is through arresting of all hemorrhage after operations (and in the case of other than operation wounds) by careful ligature of all small blood vessels. Clearly, severe discharges, seeping through a sublimated dressing, will produce a mixture of bichromate and corrosive sublimate—an albuminate of the sublimate (Lister, Address to Med., Soc. of London—Lancet Oct. 25). This mixture is still an efficient antiseptic, so that even should the discharges soak through the dressing and come in contact with the outside air, the germs—should they attempt to travel towards the wound by the track of the serious discharges—would...
Importance of Stopping all haemorrhage or exsanguination.

would find their progress barred in this way as if they were to try to find their way through the dry parts of the chest i.e. always supposing the subcutaneous dressing to be sufficiently highly charged with the antiseptic.

The initiation of serum and bichloride of mercury—the sublimated serum discharge—would kill the germs.

The case is, however, different where we have to deal with blood instead of serum discharge. According to Stiehler's a 1 in 2000 watery solution of corrosive sublimate will stop the development of bacteria and arrest decomposition. But if instead of water alone, equal parts of blood and water were used, the corrosive sublimate is unable to effect the prevention of decomposition, having to be present in a high a proportion as 1 in 600 or 1 in 400. (Simpsonbalt.

For Liverpool. No. 23. 1884.)

Therefore, until all haemorrhage has been checked after the operation, there will be a much greater probability of the case becoming aseptic.
should the discharges once find their way through the dressings. The presence of blood would make all the difference, rendering the substitute a much weaker antiseptic than when serum alone is present.

Drainage - The drainage tube used in Cases 23 (Amputation of upper arm) and 46 (Top joint excision) were absorbable tubes prepared from chicken bone. In Case 21 (Amputation of thigh) a rubber tube was employed.

On the Continent there is a growing tendency at the present day to discard drainage tubes entirely altogether. Léonard's remarks at the Copenhagen Congress show what favor those views find with high authorities in Germany.

In Edinburgh, where Professor Lyon's teaching still holds the foundation of doctrine, which the medical profession all over the world has till lately recently, regarded as altogether beyond dispute, opposite views to those formerly believed in are
are now also finding favour (I refer to John Snow's remarks on drainage in his paper "On the Treatment of Fresh Wounds" Edinburgh Medical Journal July 1882)

Sponges. In cases of failure with antiseptics, the blame is not always due to any part of the surgeon's armamentarium. It is most frequently here that it must rest. A perfectly aseptic sponge is as important in the imagination of men who are not sceptical enough ever to succeed in antiseptic work. Sponges are great causes of wound contamination because in whole cases out of ten they are not 'clean' in the modern surgical sense of the word.

They have been done without altogether. Pieces of sublimate cut or unwound can be used in their stead and destroyed afterwards.

The lotions employed in the cases under consideration (for irrigation at operations and in the after dressing, and also for other than operation bandages) were generally of the strength of 1 part of the sublimate to 1000 parts of water. The 1 in 500 solution was sometimes used — for shaving off the hair 1 in 2000 was taken —
Observations on Autogenous Wound with Carcose Sublimate (cont.)

The different varieties of sublimated dressings employed in the cases recorded were:

1. Hartmann's Sublimated Wood Wool.
2. Sublimated Absorbent Cotton wool dressings made in the Hospital.
3. Ordinary Sublimate Gauze.
4. Pure Sublimate Gauze as made by Mr. F. G. E. T. and also as obtained from Wood & Co., Manchester (maker's name not ascertained).

Wood Wool — According to Professor Paul v. Bunsen (Berl. Klein. Wochenschrift, no. 20, May 14, 1883), this material absorbs twelve times its own weight of fluid. In fact, he says it takes up rather more; for 10 grammes will, after complete saturation, weigh 130 grammes. In its absorbing power Wood Wool is according to v. Bunsen, "superior to all the dressing materials." Next to Wood Wool is Sphagnun (dried peat) and then Vetiver Root, the first absorbing twelve times and the latter eight times their own weight. But in the case of these last two materials there is the great disadvantage that they have to be prepared for use by being moistened.
Kerber himself says that, before being used, the
peat should contain from 80 to 90 per cent.
of moisture; otherwise its readiness
for absorption is impaired. Consequently
these materials lose nearly the half
of their absorbing power, while, in the case
of flax, Wood Wool in its perfectly dry
condition, completely and quickly absorbs
the discharge from the affected part.

In his "Witffühungen in der
Lieferungsleitung der Hitungs 1997,
Walcher, who introduced Wood Wool as a
healing material, gives the following table:

<table>
<thead>
<tr>
<th>Grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 dried fresh sphagnum, weight fully saturated</td>
</tr>
<tr>
<td>10 &quot; peat</td>
</tr>
<tr>
<td>10 Peat of 70% dry of moisture, which begins to burn quickly</td>
</tr>
<tr>
<td>10 Silver sand, weight fully saturated</td>
</tr>
<tr>
<td>10 Sifted coal ash</td>
</tr>
<tr>
<td>10 Fine Sand dust of Pine</td>
</tr>
<tr>
<td>10 White Fir</td>
</tr>
<tr>
<td>10 Beech</td>
</tr>
<tr>
<td>10 Fir</td>
</tr>
<tr>
<td>10 Dried Linden wood stuff</td>
</tr>
<tr>
<td>10 Spruce wood stuff</td>
</tr>
<tr>
<td>10 Wood cellulose fragments</td>
</tr>
<tr>
<td>10 Curled wood cellulose paper</td>
</tr>
</tbody>
</table>
| 10 Dried flax stuff no. 3 - slightly
  pressed and ground | 130.0 |
| 10 Prepared fine dry Wood Wool | 133.0 |
I presume Professor R. Baun’s statement with regard to the absorption power of wood wool has reference to the material uncharged with sublimate. But has sublimated wood wool—the dyesing material one gets from Hartmann’s agent in London—with a high clearing power as would place it above other sublimated dyeing materials in this respect? As compared with sublimated guars, for instance, how does it stand?

I have tried to answer this question for myself in the following way.

On the 12th of January last, at the Infirmary, Bury, I weighed out exactly 3½ lb. of Hartmann sublimated wood wool, composed this quantity into a small wire pipe, covered this and poured water, slowly, from a minimum measure, into the centre of the upper surface of the wood wool. What was observed was as follows:

(a) The water sinks into the mass of the wood wool at once. No water remains on the surface even for a moment.

(b) The moisture at the same time spreads rapidly towards the sides and apparently recollates through the mass of the wood wool in all directions.

After exactly 3½ h (by measure) of
water had been poured on, some began to trickle through.

A tumbler standing below, to catch the moisture running through, 3\text{\textsuperscript{1/2}} more were poured, slowly and gradually, on the surface of the wood wool, and while this was being done, water continued trickling through into the tumbler below.

The water in the tumbler was afterwards again measured and found to be exactly

3\text{\textsuperscript{1/2}}.

The absorption process then had stopped at 3\text{\textsuperscript{1/2}}.

II. Mixing 3\text{\textsuperscript{1/2}} (by weight) of Mr. Gill's best Salicylic Silk in the same way as the wood wool, I found that

1. Water does not sink into this dressing material at once, as it does in the case of wood wool.

It remains on the surface even though poured on quite as closely as in the case of the previous experiment.

Then, it sinks slowly into the Salicylic Silk and, when moistening of the dressing has taken place to some extent, the absorption goes on more rapidly.

2. Only 3\text{\textsuperscript{1/2}}\text{\textsuperscript{1/2}} (by measure) of water
were taken up by the Salicylic Silk when the small stream of fluid was made to flow quite in the centre of the upper surface. Those parts of the material which were towards the sides of the little wire basin were only partially soaked. The moisture did not spread so rapidly towards the sides as in the case of the Wood Wool.

When instead of directing the stream of water constantly in the centre of the mass, I took care that more portions of the Salicylic Silk which were at the margins also became soaked, I found that quite 3 of water were taken up before any drips began to trickle through the mass.

III

3 lb. by weight of zero sublimate base which I got from Wood & Co. (Manchester) was similarly tested.

No water was found to be taken up more slowly again than by the Salicylic Wood Silk. Indeed the first portion of water had to be added drop by drop to prevent their running over.

\( \frac{3}{4} \) and 20 minutes were added before the water began to trickle through, but when the remaining part of a drachm (in 40) was
also added to what had been already added, it was found that some more was taken up; so that what now trickled through was, on measurement, found to be only in 30. This was then again placed in, and about in 10 more were taken up, only in 20 having trickled through into the tumbler. In 10 minutes of this quantity were then again taken up; and finally the remaining in 10 were absorbed. So that 30 ft. (measurement) of water had been added altogether, and not a drop was left out below.

The mesh of gauze was now taken out and opened up. Portions here and there were found partially dry. The absorbing power had therefore not ceased even after 30 ft. of water had been taken up.

The conclusions which I arrive at from these experiments are:—

1) The sublimated gauze has a much higher absorption power than the wood wool; if we mean by the term absorption power the quantity of fluid which the same quantity of each material can
The wood wool, however, differs from the gauze, and from salicylic silk, in absorbing more equally and rapidly. I distinctly noticed that the gauze—the specimen of zero ultimate gauze which I obtained, I should perhaps say—absorbed more slowly than that wood wool. It was after it had been moistened to some extent, by the process of pouring the water on it, that its great capacity for absorption came into active play. This was also the case with the salicylic silk, but not to such a great extent as with the gauze. Here the wood wool has the advantage. It takes up all moisture at once. And this is very important as has been pointed out by Dr. Brent for the result is a perfectly dry wound.

I have not seen any irritation as a result of sublimation, but I have not seen any irritation, either to the wound itself or adjacent skin surfaces, result from the application of a dry wood wool dressing.
With the old sublimate gauze dressing I have seen abundant evidence of such irritation.

Why should this be? Probably because of its advantage over referred to, which wood wool has over the gauze. By its more equal absorption power it makes a dry wound more quickly. As the etheral oils present in the pine wood species may have some influence in counteracting the irritating effects of corrosives, sublimate may, in this way, perhaps, supplementing the action of the albumen in the discharges. Further, possible and very probable explanation is that the sublimate gauze which I employed may have been much highly sublaminated than the wood wool.

The caking which is a result of the very close contact of the particles of which a wood wool dressing is composed the discharges drying up and hardening them (was) found a disadvantage.

Protective with sublimate dressing. The glue's wood or gum glue protects.
protective cause such an amount of irritation whenever it had been applied on a surface there were grounds time, that I came to regard it as anything but protective in the ordinary sense of the word. I have referred specially to the mischief I have found it to do in cases 30 and 34 (vide Record of Cases).

The old green protective is out of place with sublimate, absorbent dressing, because it keeps the irritated surface moist. (I. Bums. Med. Kl. 1883).

Wochenschrift No. 20 May 14 (1883) and became I prevents the moisture in the water solution of corrosive sublimate from escaping, and so causes irritation (deterioration). (Corrosive Subl as a surgical dressing. Lancet Dec. 25 1883).

Le sublimate quarte, then once in the market in a reliable form, will not only be a perfect protective but will also make it possible to apply a sublimate dressing more readily charged with the antiseptic than any now in use.

The fatal ease - The only death which I have to chronicle - reporting there 44 cases occurred.
in connection with utter failure of antiseptic action in a deeply composed entire
ly of zero sulfamate gauze (Case 41).

Further case (10) met with the same defining material and a
volatile (trichloro) defining was substituted. Through the courtesy of Professor Lister I then learned
that none of zero sulfamate gauze was in the market with his approval
and sanction (Jan. 27, 1885).

Further
Not on Case 30 (Jan. 8 — )

The occurrence of a rash, while a sulfamate dressing was in use, and the event, at a later
date, of symptoms pointing to wound infection from the presence of a essence in the
neighboring bed, are matters in the history of Case 30 to which I have not
given deferred, though now in the
description drawn up from notes taken
at that time when the phenomena in
question were observed.

With regard to the emulsion, (Vide
Record of Cases — Case 30 — John C — )
although a similar rash was observed
by German Surgeons (Review of
Manchester Medical Chronicle for October 1882)
and ascribed to the action of ammonia.
Sulphur, it seems at least possible that the presence of other chemical substances in the dressings may have something to do with the manifestation of such skin affections. In my case at any rate, the dressings appear to have contained a copper salt (acetate) in addition to the corrosive sulphur. (See appendix.)

In connection with those symptoms which can be referred to nothing else than wound infection from the contiguity of a dead body, and which I have described, I have perhaps to explain that I was not aware of the source of infection being still in the ward when I expected the wound for skin grafting. There was a screen round that bed where the corpse, which I believed to have been already removed to the mortuary lay.

Points of importance in connection with this part of the history seem to be: (1) The time during which the wound was exposed without spray or constant irrigation about 3/4. (2) The extent of wounded surface in Case 30—large. (3) The nature of the wound. Wound infection did occur although the case had already been under treatment for several weeks and notwithstanding the fact that there was not much about the
the appearance of the wound that could be taken as characteristic of low vitality. The wounded surface, though large, was chiefly made up of healthy granulation tissue. (4) The fact of infection not being prevented by subsequent application of an antiseptic dressing, showing that germs had already penetrated beneath the surface, and to such an extent that the action of an antiseptic could not kill them. (5) A volatile antiseptic was employed in the treatment of the case both before and after exposure of the wound. (6) The time which had elapsed since the man in the adjacent bed had died — the time during which post mortem changes could have taken place. Only about 12 hr. reckoning up to the time when the skin grafting operation was commenced.

(7) The presence of large open wounds in the dead body and the decomposition changes in these. These wounds had been made by a railway truck or train passing over the man in the early part of the previous night — he having been found lying insensible some considerable time after the accident must have occurred on the line.
Appendix -

In case 30 (John E. — ) certain color changes were observed when the first and second dressings were removed. These stains seen on the abraded cotton wool are described in the history of the case. These were Firstly, red and yellow. These colors were noticed only on the occasion of the first renewal of the dressing — 4 days after admission. Secondly, there was a greenish or greenish blue color. This was seen only on the occasion of the second change of dressing. It was deeper in tint, and more of a bluish green, in the deeper layers of the dressing. It was found only in those parts where discharge had seeped through. The dry parts of the dressing were unstained. It was, further, noticed at the second change of dressing that the wound was no longer septic.

That these color changes were due to I cannot say; but it is possible that copper may have had something to do with the greenish stain observed on the second occasion. The dressing used consisted of sublimated absorbent cotton wool which had been prepared in the
The Hospital, and I found that the glycerine used in making the dressings had been boiled for some considerable time in a copper kettle, in which it had then been left standing.

It is a well known fact that acetic acid and vinegar readily act on copper vessels. Acrylic acid is the corresponding acid of the aldehyde series, of which acetic acid is the aldehyde. The glycerine, by the long continued boiling, would be made to give off acetic acid and, taking up oxygen, would then form acrylic acid. This acid then would readily act on the copper. For having having been boiled in the kettle, the glycerine was left standing in it (in the cold). Acrylate of copper would then be formed. There would therefore be in the dressings, after they had been applied to the wound:

Glycerine + Albumen + Acrylate of Copper

The albumen meeting the copper salt, a change would result which would lead to the formation of the greenish or bluish green stain seen on the dressing. This precipitate consisting
consisting of albumen and oxide of copper
and disappearing entirely on the addition
of acetic acid (Cristison &

The reason why the presence of
copper did not show itself by the green
discoloration at the first change of defi-
ning probably was because there
was then not albumen enough to per-
mit of the change leading to the
formation of the oxide of copper.
There was hardly any discharge of any
kind noticeable at the first change
of defusing. It was only at a later
stage, when much fume was coming
from the wound surface, that there
was albumen in sufficient quantity
to show the presence of copper
in the defusing, by breaking up the
soluble tannate and forming the
greenish precipitate of oxide of
copper mixed with albumen.