Mr. Cross's Thesis
on Shown Dem. 9th
Drafting by the order
of Parish Committee
H. Chinn - Read
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by Armadale
Scope and Purport of the Paper

Why ulcers occur so frequently just above the ankle

Healing of Simple Ulexation

Normal repair of Ulcer surface, with Pathology

Granulation Structure - briefly

Minute Structure

Formation of Fibrous Tissue

Regeneration of Epithelium

Treatment of Ulcers by Sponge, Derm and Skin Grafting

Sponge Grafting

Derm Grafting

Skin Grafting

Concluding Summary
PART I.

Scope and Purposes of the Paper.

In the present paper I propose to consider certain points in connection with the subject of ulceration, and to deal more particularly with the causation and practical treatment of ulcerated surfaces as they are seen among the poorest and most-indigent classes in large cities.

Since the success of any method of treatment must to a great extent depend on an accurate and scientific appreciation of the special conditions involved in the particular case, I have first, before proceeding to the subject of Treatment, thought it right to discuss some of the broader facts in the Pathology of Ulceration, and in the normal process of repair. The formation and structure of granulation tissue have therefore been first briefly considered, as well as the regeneration of epithelium, and of fibrous tissue; and later, the practical bearing of these facts in the various methods of treatment has been more fully discussed.

The plans of grafting and transplantation, which have of late years been introduced with such a marked benefit in the management of ulcerated surfaces, have been fully dealt with in my remarks, and the results of my treatment in a large number of severe cases have been
described at length, and will be found tabulated in the latter portion of my work.

Every circumstance which either directly or indirectly influences the natural process of repair of wounds, must continue to receive increasing attention, for it is only by a careful study of the conditions governing inflammatory new formation and repair, that we can hope to make further addition to our methods of treatment in these cases.

Among the various plans advocated of late, is that of George Grafting, introduced by Professor Hamilton of Aberdeen; which by setting up a mild chronic inflammation, and by acting somewhat mechanically, promotes the formation of granulation tissue, has proved of extreme utility in assisting to fill up deeply excavated surfaces.

Again - Portions of skin, transplanted either from the cadaver, or the living person, have been shown to be very valuable in completing the cicatrization of large wounds, and in acting as centers for the regeneration of epithelium.

These are some points, among others, which I have endeavoured to illustrate and discuss, in the following pages, and together with the full details of my own clinical observations, will be found tabulated in the appendix.

For the last four years my professional work in the Whitechapel Infirmary, in London, has brought me constantly in contact with a class of persons who are especially
liable to ulcers, and my attention was very early drawn to the vast number who are admitted into the hospitals, either directly or indirectly, with ulcers in addition to other maladies. Even, without attempting to estimate the amount of suffering and misery endured by ulcers among the more destitute classes; this subject is one which, from a purely social and financial point of view, must demand a greater share of attention than it has hitherto received. My experience has repeatedly demonstrated to me that, not only are ulcers a fruitful source of poverty, by incapacitating men from work, but, in addition, the pauper patients admitted into the Metropolitan workhouse infirmaries suffer in a very large proportion from these lesions. An enormous expense is, in consequence, entailed on the rates by ulcers, which are, to a very great extent preventable, and hence every addition to our knowledge of the treatment of ulcerated surfaces is of the highest importance. A reference to the following statistics (taken from the published Annual reports of the Local Government Board, and from our own books) shows at once the ultimate importance of this subject on the Metropolitan district, where my own observations have been made.

"During the entire year 1883 — 4,300 pauper patients were admitted into the Whitechapel Union Infirmary. Of these, less than 249 had to lay by primary or account of their sores — equal therefore to 5.5 per cent.

Whilst the number of these who had ulcers in addition
to the diseases which were the causes of their admittance, I have no doubt were a larger number still.

In 1883 out of 39,852 pauper patients admitted, we find 290 of them were admitted because of their ulcers, thus giving 0.7 per cent.

In the Metropolitan district there are 28 similar Union Infirmaries, containing—minus Whitechapel and its 6B9 beds—a total of 14,462 beds. And if Whitechapel with its 6B9, during the year 1883 received 290 cases of ulcer, at a similar rate for the whole Metropolitan district in 1883 alone, 6,089 patients would have been admitted solely for their ulcers. This at the average cost per head per annum actually quoted for the year 1883, viz. £10.10.11, gives the total sum £102,534.5.7.

The London ratepayers alone have to pay for maintaining, or aiding in healing, ulcerated legs.

These figures sufficiently demonstrate the vast amount of material afforded by our Workhouse Infirmaries for the study of Ulceration. In the present paper I have carefully tabulated 215 cases, and in these I especially studied the influence of the various phases of grafting and transplantation to which I have already referred. The results of my treatment were exceedingly gratifying, and convinced me that the careful management of such cases is always well repaid.

The ulcers considered in this Thesis were all of the class known as "simple healing ulcers", but in admission were all more or less, in a dirty sloughing state.
The more superficial aspect of an ulcer, I may be

remarked to which so much importance was attached in the

other nomenclature is, after all, but an artificial and

accidental circumstance, depending on a great variety of accessory

conditions present at the time. Hence among the other classical

names of ulcers, which attempt to define the condition of the part

from its appearance — such terms as inflamed,

irritable, Callous, etc. — though true as far as they go, are yet

of necessity contrary to those true principles on which alone

a scientific classification can be based. Thus

a mere accident was elevated into a primary and fundamental

position, and the same ulcer might be classed under two or

more divisions at the same time, or in different classes

at different times.

No light was thrown by such
terms on the more important pathological conditions underlying
the appearance of the part. For example, an ulcer

might be irritable or inflamed from a variety of straining

and accidental circumstances; such as, too much exercise,

dirty dressings, or want of local cleanliness, and yet

when placed under suitable conditions, rapidly organized, and

regains the natural, healthy character.

Again — improper, or a too severe plan of treatment

might transform one form of ulcer into another.

Ulcers have also been classified according to their

causes. Thus we hear of Syphilitic Ulcers, rheumatoid

ulcer, and the like. — By the Jemer, an authority observes

"In my own practice for the past seven years at the Central
London Sick Asylum, where I have had over 10,000 patients under my care, I have no hesitation in stating that three
fourths of them were more or less the subjects of acquired
or hereditary syphilis" (Dr. Bass, Vol. 1, Syphilis of the Present
page 12). With this statement I can quite agree.

Yet even if we admit that of the 509 cases with
syphilis, admitted into the Whitechapel Infirmary during the
1882-3, about three-fourths were tainted with Syphilis;
we are still confronted with the fact that their lesions were of
class, so far as superficial appearance was concerned,
were susceptible, inflamed, كاله to as the card might be.

It follows therefore that the presence of a constitutional
lesion is not sufficient to embrace alone, all the numerous
varieties of ulcer.

The classification of ulcers by their shape only,
seems to me to be equally futile - Mr. Fay states (Lancet
1888, Vol. 1. page 1687) "There are to be met with in various
ulcers in the same, some of them that would delight the most-arising
ulcerologist; but their general resemblance to other ulcers on
lesions without superficially is so great, that he would, I think,
be perfectly puzzled to supply a test by which to distinguish
the ulcer in question, otherwise than that of its coexistence
with syphilis; and then the question of consequence or
coincidence would still be open to doubt."

These considerations lead us to infer that it is
impossible to classify ulcers under any one class, dependent
on either cause, shape or appearance; hence our aim
should always be, to put the ulcer into a healthy, healing condition, and so allow the natural process of granulation to take place under the most favourable conditions. Thoro

able results can be best effected by placing the patient in bed, cleansing the sore, and preventing putrefaction.

In due time and other questions, I shall recur at a later period when I am considering the whole subject of treatment, both local and constitutional.

Why Ulcers occur so frequently just above the ankle.

One note in the annals of that of the patient's place

Treated, no less than 36 cases of the leg reaching downwards to within half an inch of an imaginary line drawn from external to internal malleolar points, both anteriorly and posteriorly.

Why is this?

It might be said that they do occur because the blood in the veins of the lower extremity has to pass uphill, and gravity very much interferes with the return of blood.

The valves are broken down, and the pressure is subjugated, if we may so term it, and thus these ulcers are caused. If such was the only cause, we should then expect they would be found rather in the feet and toes, because there is this subjugated pressure and gravity more increased than just above the ankle.

Also, in animals, we should expect a like condition, viz. that where the blood pressure is greatest in the dependent parts, the legs, ulcers should likewise occur most frequently occur.

But how rarely is this seen? and I am informed by the
attendant on the Giraffes, Zebras, Elephants, &c., in the London Zoological Gardens, that dermis pores in these animals, except from being thus extremely rare. Though the giraffe appears to give birth about seven feet of fore leg, the opportunity of elevating - No!

The reason seems to be rather -

1st That the leg and skin are mostly exposed to violence in the working classes.

2nd Blood pressure is certainly greater in the dependent parts, than in others less so.

3rd Anatomically - In the region of the ankle joint, the superficial veins communicate freely with each other, and with the deep veins of the leg. A similar condition obtains at, and for some little distance below, the knee joint. But at the lower third of the leg, the plexus principally of third venules, we find a very considerable diminution of this free anastomosis.

This first two inches above the ankle joint is where the greatest stress is laid upon these superficial veins; below that joint, they freely communicate; and if the blood cannot return by the superficial veins, it can do so by the deep veins, or vice versa.

Hence should the skin, or other tissues, in this unfortunate position be subjected to injury, these tissues have not that free anastomosing supply of blood required to prevent and remove the injured parts, and an ulcer follows.

Again - In this same region of the ankle joint, the subjacentous fasciae is extremely thick and strong. Similarly it extends below, enveloping the foot, being especially thick and strong on its plantar aspect; it also extends above the ankle joint
Joming the Anatomists very strong, Annular ligament—but above this region, the special part of these relaxes, the fascia gets thinner, and therefore less strong.

Again—there is the strong, hard, resisting fibres in this same region, between which and the force causing the injury, the soft-yielding part gets crushed; when such occurs, (and of the 45 cases tabulated 32. were so caused). The injury to the sinew, therefore is very considerably more than would have been, had the same force been applied, but the tissues behind been put, non resisting, and disseminating the force applied.
PART. II.

Healing of Simple Ulceration.

Sir James Paget, in his Lectures, edited by Professor Turner, page 87 remarks — "The ulcerative process cannot take place in healthy tissue; previous degeneration of the tissue, and that such as occurs in the inflammatory process, is a condition essential to it."

The cure is required for the "Healing of Simple Ulceration". Repair cannot take place in unhealthy tissue — and when any lesion is produced by injury, as in 32 of my recorded 145 cases; the injured parts must either be cast off as fins, or repaired by the processes of Nature.

I am convinced of the accuracy of the dictum that healing is a process of Nature; or, Professor Lee Chalmers' Lectures on the First Principles of Surgery, page 38—

"Suppose in the case of any wound, you have at length succeeded in putting a stop to the bleeding; you have sewed together the edges of the wound; you have put on the dressing. What can you now do? Nothing. The remainder is a process of nature—(Nature can make) — and you can only here and there assist that process in the direction of healing."

To assist nature, the plan I adopt a receiving a patient with an ulcer is, to place him in bed, and
devoted the bottom legs of his bed by blocks of wood 9 inches high. This gives complete rest to the patient and his feet, and reduces to a great extent the pressure of the blood in his legs. Paintings, either simple linseed, or medicated are applied; and one quickly finds the various conditions of Ulcers, Inflamed, Ulcerated or Callous, reduced by Nature to a healing crust. Then "we fix on the drooping." If the patient be very Suppurative, Black Blood or Ectopore treatment is useful. Children, and the young, if constitutionally fairly healthy, progress in the treat-ment without. Old persons seem to do best with strong, perhaps stimulating applications. But for middle aged patients, and hence, most general use, I would like to draw attention to Sanitas Oil, and its preparations, made by the Sanitas Company, Bethnal Green, London; by passing the steam through a high temperature, and thus producing the oil—It is a good antiseptic, rather weaker than Carabolic Acid, not absorbable like that drug; and as a lotion 1 in 40, as also Sanitas Surge (like Carabolic Surge) I find most useful as a non-irritating, safe, antiseptic drooping, and cure thorough.

Keeping the legs of the granulating foot only, are applied, Cold Calico, and an Elastic bandage to cover all.

Sulpho Percha, and Martin's India Rubber bandage I have found very irritating to most patients,
producing desquamations, and small pustules in the ducts, as now I may instead, the white cotton dressing bandage in the shape of a ribbon, three inches wide.

When the face is healthy, with small granulations, and slight pustular discharge, I graft.

Normal repair of ulcer's surface - with Pathology.

The frequency noted as in Case 15 recorded -

Post Mortem we find not only skin and subcutaneous fascia ulcerated, but tissues of all kinds - There was involved bone, peristems, nerves, artery, vein, capillary, fascia, and skin, all necrosed.

As soon then, as the involved tissues are removed, either by fine formation, or by reorganization; so soon does nature set about repair, though more actively in some than in others.

And repair comes only by forces that producing its like, connective tissue produces connective tissue, Blood vessels produce Blood vessels, and skin only skin.

My paper proposes treating only healing by Second Intention of John Hunter; or, by granulation and grafting, avoiding rather all other kinds, as by Immediate Union, Primary Adhesion or First Intention, cicatrization, scabbing, etc.

No tissues of the body are produced de novo. Supposing we had an ideal spot or ulcer, healing by granulation: a mere tissue by granulations being produced on the abraded surface: by means of blood clot or sponge, these granulations
may be led up to nearly or quite fill any reasonable cavity caused by previous destructive injury. The superimposed epidermises is only produced normally by a pressure from the margin, or a portion of tissue of the papillary layer of the skin that may have escaped the previous active elevation, and was under favorable circumstances—requires activity, and grows up in the wound; or artificially, sten as grafts may be placed in the granulations, which, adhering to these granulations and growing, stretch out to meet the invading margins.

The greatest difficulty I find, is this production, or regeneration of epithelium, to cover in the granulations.

Granulation structure—briefly—

Granulations generally are produced by the force imparted to the blood acting in the capillaries devoid of restraint. When the sten is whole, and acting as a restricting covering to the tissues; or internally, when there is some other restricting medium prevents their formation, as in subcutaneous processes, there are no granulations formed; but remove the sten, or make the lesion internally where there is no restraining opposing force, and then we see granulations formed.

These views, advocated first, I believe, by Professor Hamilton, in the Edinburgh Medical Journal for November 1801, as being a normal process of nature, are contrary to the generally taught, and generally received opinions—viz. that granulations are an abnormal process of nature, an inflammatory
new formation, which, as Dr. Coates expresses it, in his Manual of Pathology, page 90, "it is to be observed, in the first place, that in order to the production of granulations, the inflammation must be of some duration. Of a forced wound close within the first few days, no granulations are formed."

**Minute structure.** Each granulation is composed of a capillary loop springing from a vessel, and either returning to that vessel, or to a vein. The convexity of the loop, when complete, is always in the same direction as the blood entering that loop, indicating, it seems, that the blood pressure in its interior is the cause of this uniformity of direction of the loop, and also because, the blood pressure is unrestrained by the enveloping tissue. Their caliber is generally considered to be wider where they arch round, than where they are given off from their adjacent vessel. Around the capillary loops large numbers of leucocytes are to be seen, always lying in a delicate meshwork of fibrinous tissue. These leucocytes come into this fibrinous tissue by passing through the walls of the capillaries (this has been noted by many observers) when, in a state of inflammation, or irritation, then the capillary walls are distended and thinned by the internal blood pressure, and hence the leucocytes more easily pass through. The fluid part of the blood also exudes from the same cause, and goes to help to form the Liquor Pus, whilst the leucocytes appear as pus cells.
Formation of Fibrous Tissue.

That the result of the granulations is a fibrous tissue which fills in, and unite the elevated surfaces, most observers agree; but in how this is brought about, they differ.

Aschheim believes it due to transformation and multiplication of the afore mentioned leucocytes.

Professor Hamilton contradicts this, and following somewhat the lead of Virchow, believes in the connective tissue corpuscles as the origin. Whilst Klein very much agrees, but terms them "Elastoid Cells", each having a nucleus and nucleoli. That these connective tissue corpuscles after any irritation (as after the knife is used), or when repair is progressing, enlarge, have their nuclei elongated, divided, and proliferate with great rapidity, produce new cells which displace all adjacent tissues or lymph, cause their disintegration, and substitute for them connective tissue corpuscles.

These elongate, multiply, and form the resulting reparative fibrous tissue.

Dr. Hamilton states (4th ed.) that we are has ever seen leucocytes being transformed into connective tissue corpuscles, and that they never die; but they either are cast off in the secretion as fine cells, or, are sometimes absorbed into the circulation.

Regeneration of Epithelium.

It is, perhaps, the greatest difficulty the surgeon has to encounter in the treatment of ulcers and wounds.
Connective tissue never forms true epithelium, such has never been anatomically recorded, (what I know) though we see generally in nature the tendency of an organ or tissue to adapt itself to any extraordinary position or requirement cast upon it; as for example — in many diseases when the kidney has diminished secretion power, or may have been removed, we find the other kidney, perhaps, and the ureter, assuming the required increase to maintain the conditions required for health. So in the pear formed by connective tissue corpulcles, its surface will become somewhat squamous, like epidermis, but never forms true epidermis, in fact in embryonic life, epidermis is formed from the epiblast, but connective tissue corpulcles from the mesoblast, and it is impossible that in adult life these distinct characters should be otherwise.

When a wound is healing and about to be covered in with epithelium — it may be noted that the upper part of the connective tissue layer assumes a spindle-shaped and contracting aspect, exactly corresponding to that seen on each side of a wound healing by first intention — (and may be seen in the slides sent from the ulcer of Case 15) — that these spindle-shaped cells, contracting, naturally contract on the capillary loops in the granulations, and cut them off from the circulation, and this causes an atrophy of the granulations.

Then the epidermic cells move around first, and then over the atrophied granulations, adhering at the same time to the substrate of spindle shaped fibrous tissue, and then the ced is brought about.
It may, I think, always be noted that before any granulations
just before the invading Epidemis, they atrophy, and cease
the discharged fuses, and the foregoing explains why — A wound
with large, flatly, discharging granulations still not heal;
neither will a skin graft become attached to such a surface.

The Epidermis, according to the observations of Gersch, 
Clets and others (Virehave’s Archiv 67) is regenerated by cell
division — after the manner clearly established by Virehave 
and Renvil — Vix — First there is a division of the
nucleus of a cell, then of the nucleus, followed by division of
the cell itself, and Clets asserts that the newly formed
Epithelium cells are procured of ameboid movement, and
can proceed to the spot they have to occupy — That they
must possess this power of proliferation very actively must be
admitted when our ulcer ulcers and healthy wounds sometimes
becoming covered with epidemis at the rate of thirty to thirty
in 24 hours, or all sides up to circumference.

When the marginal skin, or from a healthy pressing graft,
repair is proceeding, the granulations will be small, discharging
very little, and about the same level as the skin, and usually
of a healthy, grey white colour — whilst the edges of epidemis
are the same colour as the skin externally, blending through
purple to bluish white, as we go inwards, ending in the
thin, red band of new formed epidemis tissue that is
invading upon the granulations —

During the process of healing by granulation, when the
epidemis is covering, or has quite covered the core, it forms

off its top, scaly, envelope just produced; its place being taken by new and more highly developed skin. I have found after an ulcer has just healed over, the covering is very thin indeed, and if the patient subjects the new cicatrix to some strain, it will often give way; therefore we keep the bed for a week or so after complete cicatrization, when several coats of new epidermic scales are usually cast off, and then the existing cicatrix is stronger, thicker, and more likely permanently to remain.
PART III.

Treatment of Ulcers by Sponge, Derm, and Skin Crafting.

History.

To John Hunter must be awarded the

credit of first showing that nature allowed an part of a living

body to be cut off its natural position and grafted on to

another part; when he demonstrated that a Cock's upper graft

on to its comb, grew, and with the increased supply of blood, to

a great magnitude. There are two of these specimens in the

museum of the Royal College of Surgeons of London - number

374 of the Catalogue from in a spinal fashion till six inches

long.

Talabotzzi 300 years ago published his great work

on plastic operations, giving the procedure for removal of

skin as a "verequa-seen", to be recorded only after complete

union had taken place. This operation has been employed

more or less, since his time.

But to M. Crevatin of Paris is due the honour of

introducing s not to nature in October 1869, that the pedicle

was not essential to skin transplantation, but may be done

without. He arranged little bits about the size of a fine's

head, mosaic fashion on the ulcers, and they grew ingrafted, and


Mr. Petlock of St. James's Hospital was the first to

introduce skin grafting into this country, and he published
his cases in the Report of the Medical Chemicaal Society 1870.

In 1870, and since, Scotch Surgeons investigating this subject, taking the skin from living patients. Dr. Paget of Edinburgh in December 1870 wrote a skin grafting, and again in the British Medical Journal for 27th May 1871.

Dr. David Fiddes of Aberdeen gave Cases in the Lancet of December 1870, advocating the use of scrapings of Epidermis scales only, which he states grew like ordinary skin grafting.

Dr. J. H. Macleod and others contributed to the literature of the subject about that time.

That the new skin is joined by the growth of the graft is proven by the fact, that when black skin is transplanted to a pig in a white man, as proved by Mr. Branyes, the newly formed skin is of the colour of the graft to the extent due to the action of the graft. Mr. Hutton has performed the experiment, placing some skin from a white man on to a negro, and it retained its original colour.

In case 13 recorded - Dark patches distinctly appeared in a sore healing rapidly, where 5 years previously grafts from a negro had been placed by the Surgeons of University Hospital. I sponged grafted this sore, and it healed, showing after the latter process a slight discoloration.

In March 1875 (British Medical Journal 7th October, 1875) Dr. C. B. Taylor reports effective skin from a lady's upper lid for pterygia, he took too much, that the patient was hardly able to close the eye, and during sleep it must remain
partially open; as he replaced the excised portion to its former site
and it healed by first intention; and the shrinkage which followed
sufficed to cure the original defect. Sir lodz of placidum,
Sir Macraughton Brown, and many others have also written on
grafting skin from the living subject.

The most extraordinary result of grafting that I have read,
may be seen in Archif Elin Cinarurgie B XXVIII.
page 562) where Helverich, in removing a large tumor from
the arm of a woman aged 35, took away the whole upper
half of the biceps, with the exception of a thin strand at its
outer part; into the cavity which was left, he promptly
introduced a large fragment of the biceps from the leg of
a dog. The cut-surfaces were carefully brought together
with sutures, no little injury as possible being done to the parts.

The transplanted muscle was much more voluminous than
the original portion, and was long after the operation
distinctly perceptible to the touch: while no current
experimentally used about three months after the operation
showed the biceps reached perfectly naturally to both kinds of
current. The movements at the bicipital joint were almost
normal.

The literature on the subject of grafting is very sparse,
I know of no book published on this subject—A pamphlet
has been written by Mr. J. Woodman of Lichfield.
Mode of Procedure.

When the granulating sore has a perfectly healthy aspect, the inflammatory process surrounds it. The margins of stain, whilst externally, passing through pale purple to faint red, internally, and invading upon the granulations. The granulations should be small, not discharging much, and of a beef steak colour.

Then I gently suction these granulations until they bleed slightly, or a normal part of the sore, and place upon their bleeding spots the sponge prepared as recommended by Professor Hamilton (Edinburgh Medical Journal, November 1876) and cut as thin as possible. It is better first washed in a tepid solution of Carbolic Acid, 1 to 100; or Sanitas Lotion, before applying, to render it of the body temperature.

If there is a small granulating surface, it may be all covered thus with sponge; but if more than a surface 2 inches square, then I partially cover it with sponge: and a very large sore would require proportionately less sponge, because of its tendency to retain secretions from the wound, which if they become a little dried on a small surface will be harmless, generally, to the patient, and it may be more thoroughly cleansed by the Surgeon. But a large surface of sponge cannot be so easily deprived of its retained fluid, and is very liable to set-up acute inflammation. Oiled silk is placed under the sponge to prevent friction, and dispriement of the graft, it is also least irritating to the skin. Then big
plugs of Zanita sponge, oozed in a Semitar lotion 1 in 20, dried, packed, and finally the last elastic bandage carefully applied. The dressing should not be removed until the second day, and then it will be found that the blood oozing has formed an inviting medium, which has done some way towards organisation, and leading the capillaries into the sponge. If the sponge is placed upon or near the epidermic margin, it will not catch nor grow (contrary to derm or skin), but acts as a foreign body, and the margin will soon be found to have firm under it and displaced the sponge. But if the sponge is upon and surrounded by granulations in a healthy wound it will become organized. In the 13 cases in which I have tried it, I have never known it not to have undergone tissue digestion.

Both and. Skin grafting requires a similar wound, preferably scratched, with a little blood is produced. The presence of a small blood clot surrounding each graft seems a decided advantage over not doing so. This is true in many of my cases. The graft should include the epidermis and Malpighian layer, but very little of the corium; it being composed of fibro cellular tissue has a decided effect—very open. The papillary layer of the corium is the essential. The epidermis in most cases when attached to the graft, though away.

I find the size most satisfactory for each graft is 3/10 of an inch long by 1/8 wide. If smaller, and their
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<td><strong>Skin</strong></td>
<td>14</td>
<td>with clot</td>
<td>61 grafts placed</td>
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upper surface should slough, as it frequently does, thus is
liable to denote their location but they are sufficiently related
to form themselves and become apparent. Larger are
apt to slough considerably, and yet get adherent to the
granulations quick enough to wholly feed.

Contrary to what obtains in sponge grafting, Dura
and skin seem to do better when attached near the
invading margin of epidermis, they seem to become very
soon incorporated by the invading epidermis, and to be
more quickly possessed of vitality and to grow, before those
placed on the same wound away from the margins; and
they seem therefore at the margins to lose less of their
substance before taking on active growth.

The dropings and after treatment of dura and
skin correspond with that of sponge before mentioned.

The presence of blood clot seems to be a very deciding
advantage in grafting; with its absence, though this is denied
by some writers. Of all the cases recorded in Table I,
Table 1
four (viz. Cases 5, 10, 38 and 39) had 61 grafts applying
the skin of the patient of the cut, and placed in blood
clot, and of these, 46 grew well, equal therefor to 75
per cent. Whilst I did three cases of
skin grafting as similar as possible, (viz. Cases 38, 39
and 40) where 14 grafts were placed on the granulations
without any blood clot, and of these only 8 grew equal
therefore to 57 per cent as against 75 per cent with the
clot. Dura grafts are not fairly comparable
Because the conditions of the field were not comparable — and all my 13 sponge grafts were placed in slight hemorrhage.

Blood clot acts mechanically, it forms a coagulum around the graft when first placed on the granulations, keeping it there in the one piece, which is very necessary for its vital attachment. Without this cementing coagulum I have joined the graft; shifted after 48 hours had elapsed, but partly so with the clot.

The Sanguinins after the graft, permeate its interstices, open them, and hereby joins greater space and facilities for the capillaries entering them from below.

Again — the clot, like sponge, is vascular, though more finely porous than any sponge — into this clot, in 12 to 24 hours, if kept acoagulum, capillaries may be seen to have entered, and in 48 hours there is often a distinct layer that gives to the clot, and it has been demonstrated by Professor Hamilton, that sponge becomes organized by the entrance into it of capillaries, and connective tissue corpuscles — the same may be seen in slides 4, 5, and 6 — next, which is a firm graft, rapidly organizing after four days' adhesion, when it has a well marked hard-like aspect, whilst at the top, but a fine finished hue around its edges.

**Sponge Grafting.**

The profession is indebted to Professor Hamilton of Aberdeen for introducing sponge grafting as a means of
repair for ulcers, and for areas with loss of tissue. It showed that it became vascular by leading up granulations, and afterwards was absorbed or transformed into firm tissue.

Such a demonstration had been anticipated; Professor Lister had previously shown that acetic spirit placed in contact with granulations, itself became vascular, and bled when scratched. Later, catgut was used for stitches, and Professor Lister showed that it became organised in the tissues, or was absorbed, and did not act

\[ \text{[Equation]} \]

united as a foreign body. This led to the use

\[ \text{[Equation]} \]

of catgut-filaments as an organised, capillary means of drainage, advocated by Professor John Chirn, afterwards catgut was employed as a drainage tube, to be organised from within outwards, expressively with the healing of the wound from within outwards.

But Dr. Hamilton leads us to expect, that as soon as the sponge becomes organised, so soon does epithelium follow and cover the cut - page 388 of the Edinburgh Medical Journal, November 1881, we find. As soon as it (the sponge) became vascular and filled with new tissue, the epithelium spreads over it. There did not seem to be any difficulty in setting the epithelium to spread over it when the underlying surface was of a proper nature, that is, whenever it became filled with young and vascular connective tissue elements."

I am sorry to state that my experience does not directly give any epidermis as a result of sponge grafting.
As we usual ordinarily superficial ulceration, it is not exudant granulations that are required for its cure. Indeed, generally we find the granulations not abundant, too elevated, indicated by the common phrase—"pure flesh," and these require for its healing, to be diminished by the action of stricturns or caustics, and the cure induced rather by proliferation of epithelium either onwards from the margins, or as separate independent centers in the granulations: such may be obtained by burn or skin grafting, but never, I experience, from sponge grafting alone. Though sponge grafts may be ungraceful when there is great loss of substance and deep excavations requiring tissue acceleration before epithelium can complete the repair.

Sponge, then, like blood clot, seems to act mechanically, and does not like burn or skin, second proliferating epidermis.

Sponge then causes tissue repair by—

1st. Sponge is useful in filling up an excavation, and in bringing granulations to the level of the margins of the ulcer, so as to allow the epithelium of the edge to grow forwards over the surface.

2nd. Sponge has no power to promote reformation of epithelium—merely exerts the formation of granulation tissue, by acting partially as a foreign body and thus setting up mild, chronic inflammation.

3rd. Grafts of skin and derm act as centers for the proliferation of epithelial cells, and are very useful after the healthy granulation tissue is at a level with the edge.

4th. Grafts of skin or derm by forming separate centers
## Table III.

<table>
<thead>
<tr>
<th>Case</th>
<th>Time of Sponge transformation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>22 days</td>
<td>Sponge came away in part part.</td>
</tr>
<tr>
<td>11</td>
<td>36.</td>
<td>0°</td>
</tr>
<tr>
<td>12</td>
<td>19.</td>
<td>0°</td>
</tr>
<tr>
<td>13</td>
<td>19</td>
<td>DROP the 12th day, all removed</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>0°</td>
</tr>
<tr>
<td>18</td>
<td>27</td>
<td>0°</td>
</tr>
<tr>
<td>20</td>
<td>28</td>
<td>He had symptoms.</td>
</tr>
<tr>
<td>24</td>
<td>39</td>
<td>0°</td>
</tr>
<tr>
<td>25</td>
<td>35</td>
<td>0°</td>
</tr>
<tr>
<td>30</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>30</td>
<td>He had symptoms.</td>
</tr>
<tr>
<td>15</td>
<td>26</td>
<td>One third removed. Symptoms followed</td>
</tr>
</tbody>
</table>

\[
\frac{12}{319} = 26.58
\]
for the reformation of epithelium, cause the ulcerated surface to become covered in by new epithelium much more rapidly, than if the epithelial regeneration were only allowed to take place from the margins of the sore.

Surgical grafts of skin or derm are important adjuvants to preliminary sponge grafting when the ulcerated surface is very large.

The one great necessity in healing by sponge grafting is to very carefully maintain its asepticity; and this can only be done, when the sponge surface is considerable, by very careful and complete irrigation with antiseptic lotions, and expressing from the sponge tissue all retained pus.

Of the 13 patients I treated with sponge, numbers 13, 14, 15, and 30, suffered from septic absorption, and required the removal of the sponge with antiseptic treatment. In 2 others—Nos. 9 and 11, the sponge came away in great part, thus removing the liability to septic absorption, and the other I required to have the graft forced occasionally as they exhibited tendencies to go wrong, by turning dark or black or colored, and smelling unpleasantly. If the graft were thin, this was a pain, keen; if thick, was rarely absent.

As may be seen in Table Number III, the average time taken for complete transformation of all sponge tissues, so as to be unrecognizable was 26.98 days.

The longest time was in Case 24, where a man aged 46, with an ulcer of 12 years' origin took 39 days.
for complete tissue dejection. The shortest, Number 32—
A man aged 143, died only 17 days. This case was only of
3 years standing, and healed very readily.

Of course, the thicker the graft, the longer is
required for organization, other things being equal. The
thicker I applied varied from 1/2 to 3/8 of an inch in
thickness, and this seems to me about the best-practical size.

**Derm. Grafting.**

This term, as used by me, meaning skin
removed from a freshly amputated limb, or from a cadaver,
soiled — I was not aware the experiment of
grafting skin from the dead on to the living had been
tried, before my first attempt 11th September 1882.

**Case 16.** But subsequent investigations seem to prove
that the Americans calculated this subject prior to myself.

In 1870, Mr. Cambretnach succeeded in transplanting
skin graftation from a leg 44 hours after amputation.

In 1870, Mr. MacLae proposed to substitute epithelium
scales for true skin.

In 1871, (St Louis Medical and Surgical Journal,
Volume VIII — July) Dr. Hodgen Transplanted Dry Epithelium
<table>
<thead>
<tr>
<th>Case</th>
<th>Source</th>
<th>Number</th>
<th>Crafts placed</th>
<th>Area removed</th>
<th>Time removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Cadaver</td>
<td>1.</td>
<td>20</td>
<td>1.</td>
<td>18 days</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>1.</td>
<td>23</td>
<td>6</td>
<td>2 days</td>
</tr>
<tr>
<td>22</td>
<td>Amputated Leg</td>
<td>2.</td>
<td>6</td>
<td>0</td>
<td>12 days</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>2.</td>
<td>6</td>
<td>3</td>
<td>30 days</td>
</tr>
<tr>
<td>25</td>
<td>Cadaver</td>
<td>3.</td>
<td>24</td>
<td>6</td>
<td>Same day</td>
</tr>
<tr>
<td>27</td>
<td>Amputated Leg</td>
<td>2.</td>
<td>12</td>
<td>3</td>
<td>95 days</td>
</tr>
<tr>
<td>28</td>
<td>Cadaver</td>
<td>3.</td>
<td>13</td>
<td>0</td>
<td>16 days</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>3.</td>
<td>13</td>
<td>0</td>
<td>18 days</td>
</tr>
<tr>
<td>31</td>
<td></td>
<td>4.</td>
<td>5</td>
<td>0</td>
<td>Same day</td>
</tr>
<tr>
<td>33</td>
<td></td>
<td>4.</td>
<td>11</td>
<td>0</td>
<td>Same day</td>
</tr>
<tr>
<td>34</td>
<td></td>
<td>4.</td>
<td>14</td>
<td>0</td>
<td>34 days</td>
</tr>
<tr>
<td>35</td>
<td></td>
<td>3.</td>
<td>20</td>
<td>2</td>
<td>Same day</td>
</tr>
<tr>
<td>42</td>
<td>Amputated Leg</td>
<td>6.</td>
<td>114</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td></td>
<td>6.</td>
<td>6</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td></td>
<td>6.</td>
<td>114</td>
<td>0</td>
<td>2 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>204</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>32</td>
<td></td>
</tr>
</tbody>
</table>
Scales from the thickest parts of the foot, and he also used flakes of detached epidermis, and they are reported to have proven.

In 1881, Dr. Aitchison of St. James' Hospital, and Dr. B. H. Chirn, grafted epidermis peeled from any part of the body, as well as cutaneous grafts, successfully.

Epidermic scales and scrapings have been tried in Scotland with varying success. Dr. Hider first tried epidermic scales purely, and similar results to the grafting of skin followed. Dr. C. H. B. Marsh had repeated his experiments with opposite results.

The late Dr. F. C. Williamson in his Edinburgh graduation thesis, reports of skin being taken from a pig at Wakefield and grafted on a man. He did not report that it grew.

My own efforts, as may be seen in Table V, comprise 15 cases; where, we find, 20 grafts were placed on these 15 others, and of them only 32 grew in 8 patients.

Of the remaining 7 patients in whom 16 grafts were applied, all went wrong, sloughed away; but in 20 dying not one of my patients suffered any constitutional disturbance—true, the discharge was profuse in these cases, sometimes turning the eider dark, and, in one instance, Number 25, the discharge was offensive, but only in one.

The reason for this sloughing of the graft seems to be, principally the length of time which had elapsed either before the autum was peeled from the body; or the length of time elapsed before it was put on the ground.

It seems interesting to note the influence occasioned
by the length of time lapsing between the decease of the owner of the strain and its application to the cord of a second person, as affecting the growth of these grafts.

It is very interesting as affecting the question, whether when life ceases in a person, if all the atoms and component elements of that individual be also dead? Also, does death always commence in one organ, or series of organs in a living being, and proceed invariably the same course till physiological death or decomposition ensue, and violate the conditions required for cell life? and if so, can we, by any known means of arresting decomposition and physiological death by antiseptics or otherwise, so preserve tissues, seed-like, that they may retain their inherent vitality for a longer or lesser period, requiring only the conditions of suitable surroundings for their development and growth?

My experiments indicate that we may so preserve these tissues — Case 27 — where of 12 grafts taken 95 days previously by Dr. Jonathan Hutchinson, and kept by me at a low temperature in a 1:50 Carbo and Glycerine solution — 3 grafts from, 

Case 23 — three pit grafts from the same
Somes were applied; three grew and formed islands or the granulations, though the dorn was removed from the boy's leg for 30 days.

Case 15—To be certain—After the dorn was 16 days removed, I placed 20 grafts on an ulcer, and up to the time of my departing for America, 21 days after, 14 grafts were discernible as thick crusts and joining.

Cases 21 and 45—Had the dorn applied the second day after its removal—On the former 23 grafts were applied. Two grew and formed a rapid cure. While of 14 grafts applied to case 45—all sloughed, because they were kept in a solution of permanganate of potash, which formed a coating over them. I found it impossible to entirely remove this stain without great irritation, hence they were in some instances applied with this packed covering of black manganese oxide. Therefore, as the granulations were intercepted in coming against the graft surfaces, it could not well be expected to find.

Cases 25, 31, 33, 35, 42, and 44—Eventually, had the dorn applied, 23 the same day that it was removed from the subject. They total 80 grafts, of which only 16 grew. Of these 16—four each grew in Cases 42, 44.
Alfred Vaughan - aged 42 - Admitted 8.12.83
Ulcer then nearly round the leg, and 5 inches up.
Grafted with Derm. 29.1.84
Photographed, 14.2.84.
and about five hours afterwards was placed on healthy healing tissue, and they grew wonderfully; (as indicated by the photographs taken afterwards) making bridges of new epithelium across the hole, and continued to grow for a considerable time; one bridge of new epithelium increased to 3½ inches wide; then repair seemed to lag, and applications did not seem to stimulate, therefore I again grafted the hole with skin, with the best results.

Case 142 very quickly healed and strongly.

Cases 25 and 35, had respectively 6 and 2 grafts from 18 in each case washed away, therefore there was very great discharge, which would not injuriously on the forming grafts. In both a relapse occurred, and the ulcer became a great eye. The reason why is not satisfactory. Very often my patients do not wish their holes healed, and therefore injure them. Case 25 did this. Case 35 is unsuitable. Similarly, because once pruned a similar result has followed when his hole was nearly well.

In Case 31, the grafting was done on a surface previously subjected to sponge grafting; the skin would not grow; and in Cases 25 and 35, where from the grafts I did satisfactorily, the resulting cicatrix was produced of such low vitality that it all broke down leaving the eye as bad as ever.

Finially, where the grafts did not satisfactorily grow and produce proliferating epithelium, there it resulted in a clear form of product; viz, a thin film appeared binding
down the granulations, keeping them small and healthy, hence
they invariably the more rapidly healed by vaginal invasion,
but the film itself did not appear to produce true epidemics.

Midway between the unsuccessful and the successful,
stands the negative evidence. That no harm was in any
case done to any patient. Though in these 15 patients
I79 often grafts underwent disorganization or skin exposed, and
very often, bleeding granulations; and though oftentimes the
grafts were a long while removed from the Caudex, still not
one bad symptom in any patient appeared to issued therefrom.
The only difference was— The discharge of pus from this
area was greatly increased, but daily dropping the wound with
antiseptic lotions, in every case, was all sufficient.

Again— In no case did any patient object to its
application— rather the reverse— nearly all were anxious to be
selected for its application— whilst many patients would not
submit to stain grafting, and discharged themselves rather
than, as they termed it, “have their bodies mutilated.”

The Successful Cases were 8 out of 15. The need
of success varied from 7/8 framing as in Case 44, 1/2 1/10,
where only 2 out of 20 applied from Case 35.

During the process of revivification of the graft of donor
applied, invariably whether in Blood Clot or not, the epidemics
would slough off away in from 1 to 3 days. The graft
then became permeated with capillaries pushed into it from
below, therefore it assumed the appearance very much of a
little kind of formulations, and often was not discerned
for a time from them; so I found difficulty in giving the
complete credit due to this method, because I could only
habitate those grafts visibly, and undeniably proving, island
like, in the formulations where more existed previous to
the grafting; and very often, by the time the grafts
whose epidermis had sloughed, had again renewed their
epidermis, the marginal skin had invaded the con,
combined with the epidermis of the new graft, and so was
pronounced and succeeded by me.

The mode of growth of each burned graft is identical
with that termed "Skin Grafting", and when taken from
the skin of the person of the skin.
In three 2 unsuccessful patients of the total 15, great
benefit occurred. They
Their arms were rapidly healed.
No pain was occasioned thereby, and no shock to life.
The replacement of their personal was needed.
The resulting healing was very much stronger than
had one been formed without any derm applied; this
was frequently illustrated as in Case 37, where the site
of the graft was indicated by a thickening, stronger epidermis,
long after complete acclimation had taken place.

Very little risk of importing constitutional malady
was occasioned, because in all cases, only a very little
of the papillary layer was retained on the graft. The
epidermis always sloughed away before the graft took an
independent action and growth.
<table>
<thead>
<tr>
<th>Case</th>
<th>Grafts placed &amp; grew.</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>12.</td>
<td>Patient died who returned to work</td>
</tr>
<tr>
<td>2.</td>
<td>8.</td>
<td>Died 2 days after going back to work</td>
</tr>
<tr>
<td>3.</td>
<td>4.</td>
<td>Discharged cured after six weeks</td>
</tr>
<tr>
<td>4.</td>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>10.</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>10.</td>
<td>Very small grafts</td>
</tr>
<tr>
<td>7.</td>
<td>5.</td>
<td>Very small grafts</td>
</tr>
<tr>
<td>8.</td>
<td>11.</td>
<td>Malignant basket cell growing grafts</td>
</tr>
<tr>
<td>9.</td>
<td>16.</td>
<td>Private patient</td>
</tr>
<tr>
<td>10.</td>
<td>21.</td>
<td>Don't separate until growing grafts</td>
</tr>
<tr>
<td>18.</td>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>4.</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>15.</td>
<td>Guttta percha produced anaphème</td>
</tr>
<tr>
<td>21.</td>
<td>10.</td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>1.</td>
<td>Little epidermis sloughing, and little discharge</td>
</tr>
<tr>
<td>23.</td>
<td>11.</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>5.</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>26.</td>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>27.</td>
<td>6.</td>
<td></td>
</tr>
<tr>
<td>133</td>
<td></td>
<td>44.</td>
</tr>
</tbody>
</table>
Skin Grafting.

In this subject, applied as meaning taking skin from the living individual, and replacing it again on the living person, I feel I have little more to add.

The known history of skin grafting I have briefly under Skin Grafting.

The most suitable cases for healing by this method, I have mentioned, as also the Modus Oferndii.

The process of healing by Skin Grafting I have also alluded to.

I have done skin grafting on 16 patients, in each case, taking the skin from one of the deltid muscles, in one or two pieces, and then subdividing them into several small sections for grafting.

At first I used M. Mathieu's scissors for removing the skin, but owing to the clumsy nature of the instrument, and its liability to break, the tiny section of skin obtainable, and the consequent number of times the limited store of my patient's plucks had to be drawn upon, I produced, say 20 graft pieces. Also to prevent the having so many small cores on the patient, I discontinued the use of these M. Mathieu's scissors, and substituted an ordinary pair of curved scissors, to take away the required amount of skin, which I elevated by catching in an ordinary pair of artery forceps, and then slicing off the required amount.

The skin removed, as far as possible, only went down far enough to include the Rete Malpighii... Immediately
Robert Lloyd. 29. Admitted 10th October 1881.
Ulcer seen 4 inches by 5 inches.
Grafted with skin 28th November 1881.
Photographed 12th April 1882.
Immediately on its removal, no bleeding usually appeared, only a dry white secretion, but invariably a few minutes after, the blood would gently ooz, but a little lint and bandage sufficed to stop this bleeding.

The manner of applying these grafts has been previously discussed.

On the 15th, 15.3 grafts were placed, and of them, 74 new immediately and aided the ulcer repair. One of my best results, where 16 out of 21 grafts did not occur on a private patient—well recovered—Case 10, where an intractable burn of 7 years standing refused all treatment, by the influence of grafting and food and special treatment, in 92 days was completely healed, and now continues healed.

Case 10—perhaps better—A deaf mute, suffering with Bright's disease and consequent ulcers of his legs, had 16 grafts placed on his sores, which had existed 7 months. They all grew, and in 115 days quite healed the sores, and though as a deaf mute he was unable to shout for encouragement, or to bear dissatisfaction, one expressed himself—he died badly, constantly in want or in the workhouse, and the cicatriz holds very firm. He was again admitted 8th of April 1894 into our Infirmary, and after 24 days rest with diuretic medicine his cirrhosis of the liver was greatly improved, then I had the accompanying photograph taken. It will show the strain put upon the cicatriz joined by these grafts, and how firmly
it continues to hold.

In three of my Cases, Numbers 3, 7, and 8— the number of grafts out of the 22 applied that grew, is not stated. There was some doubt in each case how many precisely did grow, therefore the number is omitted. But the result was.

Number 3, was a second grafting of an old intractible ulce of 4 years duration, when I placed the grafts in Blood clot, then it healed within two months, though half inches by 1 1/2 inches in extent. The first time, the grafts were applied without any blood clot, then four grew, but owing to the application afterwards of two string a solution of Lead lotion, the new grafts and tissue sloughed away.

* Numbers 7 and 8, were the two feet of a patient first bitten, and whose all the toes sloughed away. The grafts here did grow, aided by their enveloping blood clot, and the patient was discharged after 61 days quite cured, though the toes when prographed extended 3 1/4 inches by 2 inches, and 3 1/4 inches by 1 1/4 inches respectively.

It is interesting, to note, in Case 1. that though the cicatrix gave way after the patient returned to every day life as a dock labourer. Yet he states the cicatrix broke away by degrees, the new part formed by epithelial regeneration and invasion from first, it being thinned, and the grafts remained, though they afterwards sloughed away.
Case 18 is very interesting—It was my fourth attempt at grafting a very obtuse foot, when only very early excrecescences of epithelium were applied, and not including the papillary layer. Some grew, all six sloughed away in 13 days.
Concluding Summary.

There are several essential conditions modifying tissue repair I desired to treat of here, such as—

The absolute necessity of maintaining the sterility of the wound and proper, especially sponge, which is so apt to retain reactions from the wound till they become explicit, if the patient care be not used.

The necessity of rest in the prone, and the advantages of securing blood pressure in the extremities by using blocks, to elevate the foot of the bed containing the patient.

The advantages of equal and constant pressure to the vaso-lint; as best produced, I find, by a good elastic elastic pustul bandage applied.

The difficulties following the loss of adjacent phlegm tissues that cannot be drained upon.

The great necessity for a suitable diet with such patients to overcome the factor, I imagine, producing such pains, rig and debility.

Where there is any peculiar dizziness or ideocymaney peculiar to the patient, to try and remedy it by therapeutic means.

To consider tissue repair not in "A Simple healing wound."

But, I fear that the already tedious length of my paper must prevent such thing considered: and
It will require my briefly summing up the results I arrive at after many experiments.

It appears, then, looking at Table number 1, that gauzing a granulating sore, then, in a proper state, is of unquestionable value, and is called for in every case where the surface denuded of epithelium is either large, or slow of healing.

We note that in nearly every case mentioned in that table, that whereas the ulcer before treatment existed for years, it can easily be counted in days how long after gauzing was required for complete cure: then such a result could not have taken place without gauzing.

As to the kind of gauze—Sponge will not form epithelium—It will replace lost tissue; will lead up granulations and connective tissue to fill any rational sized cavity produced by previous destruction.

Will indirectly promote epithelial marginal growth, because it acts as a stimulus to the wound generally, assisted, no doubt, by the extra care the patient will take of his sore when such transformation is in progress.

Sponge will undoubtedly grow in many instances as a proper sord—It will form epithelium, and is, I think, of his greatest value when the patient objects to his own skin being used, where he does not mind that cut from an amputated limb for a cadaver.

I do not like the idea of utilizing the dead to invigorate the living, hence having satisfied myself
as to the possibility of this grafting — I propose discarding the practice and having only the skin preserved from emulsions recently performed, presenting it as long as possible, vitalized, in a perfect condition at a body temperature.

Skin from the same patient is undoubted best when it is allowed — Their can then be no fear of any infected transmisions — There is invariably the best interest for the infected skin — It forms wonderfully, and much more successfully than derm.

The resulting cicatriz is the strongest of all, and will often be as strong, or stronger (like the painting medium in some prepared bone) than the original tissue.

And it have tried to prove that the Nello Malphigii is the essential in the latter two kinds of grafting. Epidermis alone is useless. Both will slough away, when placed on the granulations. And the epidermis of a skin graft will invariably slough off, and is much discharge from the granulations. And granulations discharging much are differently unhealthy, and do not so actively take or attachments to the grafts.

That placing the grafts in Blood Clot is of undoubted value, because it just acts as a cement to keep the grafts and granulations sufficiently long in.
NOTES
on
Ulcer Grafting
by
SPONGE DERM and SKIN,
45 Cases treated.

for
Graduation Thesis,
by
P. W. Perkins Case M.B.
1884.
Joseph Francis, aged 60, had a large ulcer on the lower third of front of his right leg. It was of many years standing. Since 1891, it extended 3/2 inches around his leg, and 2 1/2 inches from above downwards. It was then in a fairly healthy, healing state.

Treatment: The large piece of skin was taken from over the insertion of his left deltoid muscle, cutting into the whole of the cutis vera, and this large piece was subdivided into twelve parts. Each part about the size of half a split pea; they were placed in two upon the ulcer, each pair being held in position by strips of linen adhesive plaster. Each strip of plaster having a second strip attached to its centre, and the plaster to plaster, thus it passed over the grafts, thus giving to these grafts a linen surface, instead of presenting the adhesive side. Carbonic acid mist was applied, and the dressings not removed for two days and a half. Then dried every second day. Six grafts took well; the did not. They continued to grow well, till he discharged himself the following August, with his sore healing rapidly.

Result: 12 grafts—6 grew, 6 did not.

Seeing this patient, the 10th October 1891, he informed me he was ready to work after leaving the Infirmary, that he noted his prorafer get smaller 1 less distinct, as he was smaller to be carefully treated in the Infirmary; and that the centre seems to be the least to disappear.
Elizabet Taylor, aged 33. Seamstress was admitted 1879 with a large ulcer in the lower third of the right leg.

**History.** It has been an open sore over 5 years. She has been to several hospitals but has never had her ulcer cured.

**Present State** Since 1881. It was an elongated sore, on the right lateral and intersosseous region, extending from 1 inch above an imaginary line drawn from the tip of the external malleolus to the tip of the internal malleolus, 4 1/2 inches from below upwards, 1/2 inch wide at its lower part, 1/2 inches above.

Six grafts of skin, taken in one piece from her left arm and divided, were placed on the sore as Case I and similarly treated. Four days, and in two months the ulcer was reduced to just 1/2 inch. Then Ino Plumbi Jíj, agra Jíj was applied, and a marvin's bandage, and two days afterwards all the four grafts and wound healed and broken down, and the sore was as large as before.

**Second Grafting** September 1881. Eight grafts were inserted; now the granulations hard like plaster, but they bleed slightly, and the grafts placed on the granulated part, and surrounded by a very little blood. Cold milk was more applied, the plaster, then Carabolic droppings. The third day the droppings were removed and all looked satisfactory; dressed after every second day, and by the 24th November, it was quite healed.

**Result**—Healed after 5 years previous resistance to all treatment.
Case III  Skin Grafting.

James Wilson had an ulcer on the lower part of his leg 4 inches from above downwards, and 1 to 1½ inches around the leg — in June 1881. The ulcer was granulating well healthy looking. Then one piece of skin was taken from his arm, subdivided into pieces & placed on the ulcer. 8 weeks & pus formed, patient was kept persistently in bed, and in about five months he was discharged cured.

Result Discharged Cured — 8 weeks — 6 weeks —

Case IV  Skin Grafting

Robert Lloyd, aged 29. — A deaf mutes, Shoebrook, was admitted 10th October 1881 with an old Phagedenic, longstanding ulcer on the left leg.

History It was caused by the bite of a dog 4 months previously, it increased in size till it reached 23rd November — how the ulcer is about 3 inches above a malleolar line on his left leg, 4 inches from arm downward, and 3 inches across, margin, healthy and invading — Granulations small & of a bright red colour.

16 grafts were applied as in former cases, dressed with Sandercott's liquid, old silk, band —

20th preped for the first time, grafts will adhering — some appear
to have capillaries running into them through the attaching blood clot, which appears organizing,

8th Dec. - Operation very second day. Improvement marked each time.

Smoothed paraffin - One graft at the margin is surrounded by new epithelium. Another at the centre is three times its original size, and one near the bottom has grown 3/4 inch, extending from it.

General health good.

29th Dec. Leg was quite healed. The grafts have all coalesced with the marginal skin. The edge of the graft has thicker skin than that between these latter. Patient was set up daily.

13th Jan. All dressings stopped - only tincture of bichloride applied over the surface daily. To be a slight protection while the cuts form thicker.

18th Jan. Discharged with a very firm cicatrix.

Result: 16 grafts, all take.

Case VI. Skin Grafting.


History: 2 years ago, in addition to acne, he had adenitis, and pit with months after, his legs were injected. Trench wound was formed; these injuries healed forming a pore which has never since healed. He has attended several hospitals, with only slight benefit.
Present State. This ulcer on the front of the left instep is half-inch in
size above downwards; 2½ around, narrowing downwards and
inwards. It was treated by winning, and i bid it to -

13th March - 16 small grafts were placed on the
granulations after each was fully had been gently palpatated with a
little blood flowed in from a capillary, and in this the graft
placed. Draping with silk - Luith. Juta Polka Brand and
Dinitro Lotion -

17th - considerably discharge being a slight
smell: all grafts are in position, but their external covering
soft and apparently breaking down -

19th - great discharge, grafts appear softer and much
smaller.

21st March. All epidermic portions gone, and only
a few crabs mark the situation of each graft - the white
paler surfaced appears congested, as though due to increased
activity and vascularitiy -

Result of 16 grafts none with -

Cases VII and VIII. Skin Grafting.

Anne Moore, aged 25. Single, domestic, admitted
16th June, in a very filthy destitute condition, stating she had been
exposed to the rain of a fierce storm two nights previously, and
passed two nights sleeping under archways -

Present State. Semimortal. Very joint. Her feet
black, with dirt + She has no power of movement of the
lower limbs. toes post bitten. She appears very claim -
Treatment. 30th September 91. Her leg condition has greatly improved, the part just behind bone sloughed away from back foot. The right foot: from the head of the metatarsal bone of the great toe to one inch below the head of the fifth metatarsal bone; but this plantar muscles was not as extensively sloughed as the dorsal muscles and tissue. This heals.

The left foot—slightly less, very from one inch anterior to the head of the metatarsal bone of the great toe outwardly from the head of the other metatarsal bone—

20th January 92. This came under my care—

23rd. I placed a Tfrac. on the right foot—

left foot—each graft having a new, pre-cut graft prepared for it. A previously slight debridement of the granulations till they bleed enough to form a blood clot in which to place each graft. They were kept in position by strips of adhesive plaster as in Case 1.

27th. T Sports very second day, most of grafts have their epidermic surfaces breaking down, but their linear parts had become attached by the needle blood, which was becoming organized.

31st. Grafts appear now very small indeed; not so distinct because of their upper white surfaces having sloughed away, and their lower surfaces becoming invaded with capillary blood.

10th February. Grafts doing well, now forming islands of individual separate growth.

1st March. Diet just quite well, the new skin appears va

5th March. Discharged quite cured.

Result of 10 grafts—three growing uncertain.
John Clarke, aged 62. A blind beggar was my first patient to try sponge grafting on, because he had an ulcering leg and ulcer, and, of course, could not see my fingers afterwards.

He was admitted 1st June 1892, with a large ulcer on his right leg.

**History**  He has been a hand charlitan for many years. He has been very much exposed. His ulcers were caused 20 years ago, and since then have been cured longer than three months at any time. Ulcers have now been seen over seven months.

**Present State**  About five inches above a malleolar line on the front of his right leg were three irregular ulcers, very dirty, and discharging very much.

**Treatment**  25th June. All three ulcers were covered with sponge grafts. (The sponge prepared as recommended by Professor Hamilton in the Edinburgh Medical Journal.)

All the ulcers had been scratched till blood flowed slightly. Largest ulcer was about 2 inches square. Lesser... very superficial, measured 1½ inches by 1 inch. Least... about the size and shape of a florin - dressing from Santan's paste, (similar to Carbolic paste), and a white elastic bandage.

30th. The dressing was considerably soaked with discharge, no place remaining the contraction from the paste. Small ulcer.

All the ulcers were still, excepting the heel ulcer, where it had shifted down. One partly overlapping the margin, but even...
The blood clot has acted as a cement and produced a good union.

The interstices of the sponge were filled with pus. Each graft was seamed and no other. The exuactions were of an orange hue. Slighty raising these exuactions did not cause bleeding.

4th July — no graft came away from the lower right piece, causing enough hemorrhage, to run over the edge of the ulcer.

6th July — the sponge came away in my great part from the smaller round, leaving a complete epidermal covering below.

7th July — quite greater activity in the granulations, i.e., perhaps, incorporate some of its substances, it was the other as a protection, similar to healing by scabbing.

20th July — some of the sponge fibers have come away attached to the dressing, leaving small particles attached to the granulations. The size of a mustard seed. There has been considerable marginal growth.

11th July — no exuactions discernible.

20th July — All the ulcers are quite healed. The largest was the last to heal. Most are covered by their original epithelium.

The least were covered with healthy botting epithelium.

Result — Three ulcers cured by sponge grafting to after

22 days, treatment —
Case X - Skin Grafting.

Mr. S., a private patient, aged 47. Fracture -

History - Seven years ago, in trying to put out a fire caused by paraffine, he got a burn on his right leg; it extended considerably up and down the leg, but healed up.

A core 4 1/2 inches from above downwards, and 5 1/2 inches around, which for three years had resisted all treatment.

Surgical - 6 April 1912. The core was of the bone only, not discharging much, but having somewhat callous edges.

21 grafts taken as one piece from his right arm, each about the size of half a pea, were placed in the disfigured from below in a little blood clot - and Santa Ana suture - add salt, Santa Ana gain, Santa Ana liquid and a bandage -

26th May - 16 grafts, bandage taken off. The wound was reduced to a square of 1 1/2 inches. The grafts are well healing the surface, but some have united with the sutures.

4th July - 21st was 15 grafts since my operation.

He has attended his shop twice the end of May, gradually increasing his standing and posture, uses his left, looks to, and stands behind his counter nearly all day - . The suture is about the size of a pea, with wick, thin, healing edges.

This pore in status was caused by cutting off one of the epithelial scales covering the paw. Originally it was quite healed - it now looks scaley, otherwise strong.

Result - quickly cured 16 grafts, taking off 21 places.
attendant on the Giraffe, Zebra, Elephant, &c. in the Gordon Zoological Gardens, that drains pores or clear fluids, except from the vestibule, are extremely rare. Though one Giraffe appears to give about twelve feet of pure milk, the opportunity of utilization - No!

The reasons seem to be rather:

1. That the leg and skin are mostly exposed to violence in the working classes.

2. Blood pressure is certainly greater in the dependent parts than in others less so.

3. Anatomically - In the region of the ankle joint, the superficial veins communicate freely with each other, and with the deep veins of the leg. A similar condition obtains at, and for some little distance below, the knee joint. But at the lower third of the leg, the plexus, principally of their relatives, are joint a very considerable diminution of this free communications.

The first two inches above the ankle joint - is where the greatest stress is laid upon these superficial veins; below that point they freely communicate; and if the blood cannot return by the superficial veins, it can do so by the deep veins, or vice versa. Hence should the skin, or other tissues, in this unfortunate position be subject to injury, these tissues have not that free anaastomosed supply of blood required to remove and repandise the injured parts, and as follows.

Again - In this same region of the ankle joint, the subcutaneous fascia is extremely thick and strong. Similarly, it extends below, involving the foot, being especially thick and strong on its plantar aspect; it also extends above the ankle joint.
Joining the anatomists very strong, Annular ligament, but above this region, the special tensile strains relax, this fascia gets thinner, and therefore less strong.

Again, there is the strong, hard, resisting fibres in this same region, between which and the force causing the injury, the soft-yielding strain gets compressed, when such occurs. (and of the 45 cases tabulated 32 were so caused). The injury to the skin therefore is very considerably more than would have been, had the same force been applied, but the tissues behind been less, not resisting, and disseminating the force applied.
PART. II.

Healing of Simple Ulceration.

Sir James Paget, in his Lectures, edited by Professor Turner, page 111 remarks— "The ulcerative process cannot take place in healthy tissue; previous degeneration of the tissue, and that such an excess in the inflammatory process, is a condition essential to it."

The answer is required for the "Healing of Simple Ulceration." Repair cannot take place in unhealthy tissue— and when any lesion is produced by injury, as in 32 of my recorded 145 cases, the injured parts must either be cast-off as pus, or performed by the process of Nature.

I am convinced of the accuracy of the dictum, "that healing is a process of Nature"; or, Professor Albee's Lectures on the "First Principles of Surgery," page 38— "Suppose in the case of any wound, you have at length succeeded in putting a stop to the bleeding; you have sewed together the edges of the wound; you have tied on the dressing. What can you now do? Nothing. The remainder is a process of nature (Nature we mind) — and you can only have and feel assist that process in the direction of healing."

To assist Nature, the plan I adopt is, to place him in bed, and
elevate the bottom legs of his bed by blocks of wood 8 inches high. This gives complete rest to the patient and his parts, and reduces to a great extent the pressure of the blood in his legs. Poultices, either simple bandaged, or medicated are applied; and one quickly finds the various conditions of Ulcers, Inflamed, Swollen or Callous, reduced by Nature to a healing state. Then **we put on the dressing**. If the patient be very syphilitic, Black Blood or Tuberous Tissues is useful. Children, and the young, if constitutionally fairly healthy, progress on the most innocent lotions. Old persons seem to do best with strong, perhaps stimulating applications. But for middle aged patients, and hands, most general use, I would like to draw attention to Sanitas Oil, and its preparations, made by the Sanitas Company, Brompton Green, London: by passing steam through Turpentine at a high temperature, and thus producing this oil. It is a good antiseptic, rather weaker than Carbolic Acid, no absorbable like that drug; and as a lotion, 1 in 40, as also Sanitas Jounce (like Carbolic Jounce) I find most useful as a non-irritating, safe, antiseptic dressing, and use it chiefly.

Helping the legs of the gravely healing only, are applied, Ciled Calico, and an elastic bandage to cover all. Sutta Percha Dress, and Martino's India Rubber Bandage I have found very irritating to most patients,
Normal repair of Ulcer's surface — with Pathology.

One frequently notes as in Case 13 recorded—

Post Mortem we find not only skin and subcutaneous fascia ulcerated, but tissues of all kinds — those now involved lose, Peristium, Nerves, Artery, Vein, Capillary, Fascia, and skin, all necrosed.

As soon then, as the mortis tissue are removed, either by puriform, or by reorganization, so soon does nature set about repair; though more actively in some than in others.

And repair seems only be pleased by like producing its kind, connective tissue produces connective tissue; Blood vessels, produce Blood Vessels; and skin only skin.

This paper proposes treating only: Healing by Second Intention” of John Hunter; or, By granulation and grafting, avoiding rather all other kinds, as By Immediate Union, Primary Adhesion or First Intention, Cicalization, Scabbing, &c.

If tissues of the body are produced de novo. Supposing we have an ideal skin or other, healing by granulation:

A new derma by granulations being produced on the abraded surface: by means of blood clot or sponge, these granulations
may be led up to nearly or quite fill any reasonable vacancy caused by previous destruction of tissue. The superficial
epidermis is only produced normally by a growing in from the
margin, or a growing of some of the papillary layer of the skin
that may have escaped, the previous entire elevation, and
now under favorable circumstances requires activity, and grows
up to the wound: or artificially, when a graft may be
placed or the granulations, which, adhering to these granulations
and growing, stretch out to meet the invading margins.

The greatest difficulty I find, is this production, or
regeneration of epithelium, to cover in the granulations.

**Granulation Structure - briefly -**

Granulations generally are produced by the force
imported to the blood, acting in the capillaries devoid of
resistive. Then the tissue is whole, and acting
as a restricting covering to the lesion; or internally, where
there is now other restricting medium prevents their
formation, as in subcutaneous wounds, there are no granulations
formed; but remove the skin, or make the lesion internally
where there is no restraining opposing force, and there we see
granulations formed. These views, advanced first,
I believe, by Professor Hamilton in the Edinburgh Medical
Journal for November 1821, as being a normal process
of nature, are contrary to the generally taught, and
generally received opinions - viz that granulations are
an abnormal process of nature - an inflammatory
new formation, which as Dr. Coates expresses it in his Manual of Pathology, page 90: "It is to be observed in the first place, that in order to the production of granulations, the inflammation must be of some duration. If a wound should close within the first few days, no granulations are formed."

Minute structure: Each granulation is composed of a capillary loop springing from a vessel, and either returning to that vessel, or to a vein. The convexity of the loop, when complete, is always in the same direction as the blood entering that loop, indicating, it seems, that the blood pressure in its interior is the cause of this uniformity of direction of the loop, and also because the blood pressure is unimpeded by the enveloping stroma. Their caliber is generally considered to be wider where they are found, than where they are given off from their adjacent vessel. Around the capillary loops large numbers of leucocytes are to be seen, always lying in a delicate network of fibrous tissue.

These leucocytes come into this fibrous tissue by passing through the walls of the capillaries (as has been noted by many observers) when in a state of inflammation, or irritation; then the capillary walls are distended and filled by the internal blood pressure, and hence the leucocytes more easily pass through. This fluid part of the blood also escapes from the same cause, and goes to help to form the Liquor Pura, whilst the leucocytes appear as free cells.
Formation of Fibrous Tissue.

That the result of the fracturations is a fibrous tissue which fills in, and emotes the ulcerated surface, most observers agree; but in how this is brought about, they differ.

Coleridge believes it due to transformation and multiplication of the afore-mentioned leukocytes.

Professor Hamilton contradicts this, and following somewhat the lead of Virchow, believes in the connective tissue corpuscles as the origin—whilst Klein very much agrees, but terms them "Pluricell Cells", each having a nucleus and nucleoli. That these connective tissue corpuscles after any irritation (as after the knife is used), or when repair is progressing, enlarge, have their nuclei elongated, divide, and proliferate with great rapidity, produces new cells which displaces all adjacent tissues or lymph, cause their disintegration, and substitute for them connective tissue corpuscles. These elongate, unite to and form the resulting reparative fibrous tissue.

Dr. Hamilton states (often cit) that no one has ever seen leukocytes being transformed into connective tissue corpuscles, and that they never are; but they either are cast-off in the secretion as free cells or, are sometimes phagocytes into the circulation.

Regeneration of Epithelium.

Is perhaps, the greatest difficulty the surgeon has to encounter in the treatment of ulcers and wounds.
Connective tissue never forms true epithelium, and has never been anatomically recorded; (that I know) though we see generally in Nature the tendency of an organ or tissue to adapt itself to any extraordinary position or requirement cast upon it; as for example — In many diseases when the kidney has diminished secretory power, or may have been wounded, we find the other kidney, perhaps, and the skin, assuming the required increase to maintain the conditions required for health. So in the scar formed by connective tissue corporacles, its surface will become somewhat squamous like epidermis, but never forms true epidermis — In fact in Embryonic life — Epidermis is formed from the Epiblast, but Connective tissue corporacles form the mesoblast, and it is impossible that in adult life these distinct characters should be otherwise.

When a wound is healing and about to be covered in with epithelium - it may be noted that the upper part of the connective tissue layer assumes a spindled shaped and contracting aspect, exactly corresponding to that seen on each side of a wound healing by first intention — (Such may be seen in the slides and from the data of Case 15) That these spindled shaped cells contracting, naturally contract on the capillary drops in the granulations, and cut them off from the circulation, and this causes an atrophy of the granulations.

Then the epidermic cells press around first, and then over the atrophied granulations, adhering at the same time to the substrata of spindled shaped fibrous tissue, and thus the cure is brought about.
It may, I think, always be noted that before any granulations fill before the invading epithelium, they atrophy, and cease to discharge pus, and the foregoing explains why — A wound with large, flatly, discharging granulations will not heal. Neither will a thin graft become attached to such a surface.

The Epidermis, according to the observations of Bichat, Waller, and others (Virchow's Archiv 67) is regenerated by cell division — after the manner clearly established by Virchow and Remak — viz — First there is a division of the nucleus of a cell, then of the nucleolar, followed by division of the cell itself, and Waller asserts that these newly formed epithelial cells are procured by amnblastoid movement, and can proceed to the spot they have to occupy — That they must possess this power of proliferation very actively must be admitted when one notes ulcers and healthy wounds sometimes becoming covered with epithelium at the rate of 1 inch to 1 inch in 24 hours, or all sides of its circumference.

When the marginal skin, or from a healthy moving graft, repair is proceeding, the granulations will be small, discharging very little, and almost the same level as the skin, and usually of a healthy, beef steak colour — whilst the edges of epidermis are the same colour as the skin externally, blending through purple to bluish white, as we go inwards, ending in the dry, red band of newly formed epithelial tissue that is invading after the granulations —

During the process of healing by granulation, when the epidermis is covering, it has quite covered the core, it then
off its top, scaly, superficial, and fluid portion; its place being taken by new and more highly developed skin. I have found, indeed, that after an ulcer has just healed over, the covering is very thin, and if the patient subjects the new cicatrix to some strain, it will often give way; therefore we keep him in bed for a week or so after complete cicatrisation, then several crops of new epidermic scales are usually cast off, and then the existing cicatrix is stronger, tougher, and more likely permanently to remain.
PART III.

Treatment of Ulcers by Sponge, Derm and Skin Grafting.

History. John Hunter must be awarded the

credit of first showing that nature allowed one part of a living
body to be cut off its natural position and grafted on to
another part; then he demonstrated that a Cock's feather grafted
on to its comb, grew, and with the increased supply of blood, to
a great magnitude. These are two of these specimens in the

museum of the Royal College of Surgeons of London - number
374 of the catalogue price in a special fashion till six inches
long.

Talhauozzi 300 years ago published his great work
on plastic operations, giving the predicate to the removal of
skin, as a prime qua-nom, to be performed only after complete
union had taken place. This operation has been employed
more or less, since this time.

But to M. Castorin of Paris is due the honour of
introducing this to notice, in October 1859, that the predilection
was not essential to skin transplantation, but may be done
without. He arranged little bits about the size of a pain's
head, mosaic fashion on the ulcer, and they were ingrafted, and
see. 220 Bull de la Soc de Chir - November 22, 1841.

Mr. Pollock of St. James's Hospital was the first to
introduce skin grafting into this country, and he published
his cases in the Report of the Medico-Chirurgical Society 1870.

In 1870, and since, Scotch Surgeons investigated this subject, taking the skin from living patients. Dr. Pape of Edinburgh in December 1870 wrote a skin grafting, and again in the British Medical Journal for 24th May 1871.

Dr. David Fiddes of Aberdeen gave cases in the Lancet of December 1870, advocating the use of scratched epidermic scales only, which he states grew like ordinary skin grafting.

Dr. J. H. Macleod and others contributed to the literature of the subject about that time.

That the new skin is joined by the growth of the graft is proven by the fact, that when black skin is grafted on a pore in a white man, as recorded by Mr. Benedict, the newly joined skin is of the colour of the graft to the extent due to the action of the graft—Mr. Holmes has pursued the experiment, placing some skin from a white man on to a negro, and it retained its original colour.

In Case 13 recorded—Dark papules distinctly appeared in a sore healing rapidly, where 3 years previously a graft from a negro had been placed by the Surgeons of University Hospital—I opened grafted this scar, and it healed, showing after this latter process a slight discoloration.

In March 1875 (British Medical Journal 7th October, 1875) Dr. C. B. Taylor reports raising skin from a lady's upper lid for ptosis, he took too much, that the patient was hardly able to close the eye, and during sleep it must remain
punctured, open"; so he replaced the excised portion to its former site and it healed by first intention, and the shrivelling which followed sufficed to cure the original defect. In hope of success, Dr Macnabton, Dr Macnabton, and many others have also written on grafting skin from the living subject.

The most extraordinary result of grafting that I have noticed may be seen in Archirf Tin Chirurgic B XXVIII. page 362) where Helyerd, in removing a jilm saccoma from the arm of a woman aged 30, took away the whole upper half of the biceps, with the exception of a thin strand at its outer part. Into the cavity which was left, he promptly introduced a large fragment of the biceps from the leg of a dog. The cut surfaces were carefully brought together with sutures, as little injury as possible being done to the parts.

The transplanted muscle was much more voluminous than the original portion and was long after the operation distinctly perceptible to the touch. Electric currents experimentally used about three weeks after the operation showed the biceps reacted perfectly naturally to both kinds of current. The movements at the elbow joint were almost normal.

The literature on the subject of grafting is very sparse, I know of no book published on this subject. A pamphlet has been written by Mr. J. Woodman of Limer...
Mode of Procedure.

When the granulating core has a perfectly healthy aspect, the inflammatory process surrounds it. The margins of skin, whitish externally, passing through pale purple to faint red internally, and invading upon the granulations. The granulations should be small, not discharging much, and of a blueish color.

Then, if danger persists, place granulations until they bleed slightly, or near part of the core, and place upon these bleeding spots the sponge prepared as recommended by Professor Hamilton (Edinburgh Medical Journal, November 1881) and cut as thin as possible. It is better first soaked in a tepid solution of carbolic acid, 1 to 100, or Surius & Lotion, before applying, to render it of the body temperature.

If there is a small granulating surface, it may be all covered thus with sponge, but if more than a surface 2 inches square, then I partially cover it with sponge; and a very large core would require proportionately less sponge, because of its tendency to retain exudations from the wound, which if they become a little septic on a small surface will be harmless generally to the patient, and it may be more thoroughly cleansed by the Surgeon, but a large surface of sponge cannot be so easily deprived of its retained pus, and is very liable to set up septic inflammation. Oiled silk is placed under the sponge to prevent friction, and displacement of the graft, it is also least irritating to the skin. Then big
pieces of similar gauze, soaked in a similar lotion 1 in 20, dried, cut into, and finally the wet elastic bandage carefully applying.

Two dressings should not be permitted with the second day, and then it will be found that the blood coagulation formed an inviting medium, which has some some to make organization, and leading the capillaries into the sponge.

If the sponge is placed upon or near the epidermis margin it will not adhere nor grow (contrary to dermis or skin), but acts as a foreign body, and the margin will soon be found to have sunken under it and displaced the sponge. But if the sponge be upon and surrounded by formulations in a healthy wound it will become organized.

In the 13 cases in which I have tried it, I have never known it not to have undergone some digestion.

Skin and Skin grafting requires a similar wound, preferably matched with a little blood is produced. The presence of a small blood clot surrounding each graft area a decided advantage was not doing so. This is seen in many of my cases.

The graft should include the epidermis and Malphigian layer, but very little of the corium; it being composed of fine cellular tissue has a deterrent effect very open. The papillary layer of the cutis is the essential. The epidermis in most cases when attached to the graft, clings away.

The size I find most satisfactory for each graft is 3/9 of an inch long by 3/8 wide. If smaller, and their
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<td><strong>Skin</strong></td>
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<td><strong>Skin</strong></td>
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upper surface should thicken, as it frequently does, there is little to denote their location but they are sufficiently, rotating to form themselves and become apparent. Larger and apt to thicken considerably, and not yet cohered to the granulations quick enough to wholly form.

Contrary to what obtains in sponge grafting, form and skin seem to do better, when attached near the invading margin of epidermis, it appears to become very firm incorporated by the invading epidermis, and to be more quickly possessed of vitality and to grow, before they are placed on the same wound away from the margins; and they seem therefore at the margins to lose less of their substance before taking or active growth.

The droppings and after treatment of form and skin correspond with that of sponge before mentioned.

The presence of blood clot seems to me a very decided advantage in grafting, without its absence, though this is denied by some writers. Of all the cases recorded in Table I, four (viz. Cases 5, 11, 36 and 37) had 61 grafts applied for skin of the precessor of the toe, and placed in blood clot, and of these, 46 grew well, equal therefore 69 per cent.

Whilst 8 did three cases of skin grafting as similar as possible, (viz. Cases 38, 39 and 40) where 14 grafts were placed on the granulations without any blood clot, and of these only 8 grew equal therefore 57 per cent, as against 75 per cent with the clot. Therefrom grafts are not fairly comparable.
because the conditions of the skin were non-comparable. And all my 13 sponge grafts were placed in slight hemorrhage.

Blood clot acts mechanically, it forms a copula around the graft when first placed on the granulations, keeping it close on the one side, which is very necessary for its vital attachment. Without this cementing copula I have found the graft shifted after 48 hours had elapsed, but firmly on with the clot.

The liguer Laugehns affixes the graft, permeates its sinuities, opens them, and thereby gives greater space and facilities for the capillaries entering them from below.

Again - the clot, like sponge, is vascular, though more finely porous than any sponge - into this clot, in 6 hours to 24 hours, if kept aerobic, capillaries may be seen to have entered, and in 48 hours there is often a distinct pustule just given to the clot, and it has been demonstrated by Professor Hamilton, that sponge becomes organised by the entrance into it of capillaries, and connected round corporules. The same may be seen in Slides 1, 2, 3, and 6 - but which is a dermis graft rapidly organizing after four days' culture, when it had a well-marked and like aspect, whilst at the top, but a fine fnished line around its edges.

Sponge Grafting.

The procedure is indebted to Professor Hamilton of Aberdeen for introducing sponge grafting as a means of
repair for shallow cuts, or even with loss of tissue. He showed that it became vascular by leading up granulations, and afterwards was absorbed or transformed into fibrous tissue.

Such a demonstration had been anticipated; Professor Lister had previously shown that oestere fibri placed in contact with granulations, itself became vascular, and bled when scratched. Later - Calgut was used for stitches, and Professor Lister showed that it became organized in the tissues, or was absorbed, and did not ultimately as a foreign body.

This led to the use of Calgut - filaments as an organized, capillary means of drainage, advocated by Professor John Chirie; afterwards calgut was employed as a drained tube, to be organized from within outward, synchronous with the healing of the wound from within outward.

But - Dr. Hamilton leads one to expect, that as soon as the sponge become organized, as soon does epithelium follow and cover the core - page 388 of the Edinburgh Medical Journal, November 1881, we find. As soon as it (the sponge) became vascular and filled with new tissue the epithelium spreads over it. There did not seem to be any difficulty in getting the epithelium to spread over it when the underlying surface was of a proper nature. That is, whenever it became filled with young and vascular connective tissue elements.

I am happy to state that my experience does not directly give any epidemics as a result of sponge grafting.
As we meet ordinary superficial ulceration, it is not at
branulations that are required for its cure: indeed, generally
we find the granulations too abundant, too elevated, indicated
by the common phrase—"foul flesh," and these require for its
treatment, to be eliminated by the action of antiseptics or
cauteries, and the cure induced—rather by proliferation of epithelium
either inwards from the margins, or as separate independent
centers on the granulations: and may be obtained by skin or
skin grafting, but never, I experienced, from sponge grafting
alone. Though sponge grafts may be very useful when there is
want—loss of substance and deep excavations, requiring
some acceleration before epithelium can complete the repair.

Sponge, then, like blood clot, seems to act mechanically,
and does not like skin or skin, become proliferating epithelium.

Sponge, then causes tissue repair by—

1st. Sponge is useful in filling up an excavation, and in
 bringing granulations to the level of the margin of the ulcer,
 so as to allow the epithelium of the edge to push inwards
 over the surface.

2nd. Sponge has no power to promote reformation of epithelium
 it merely supports the formation of granulation tissue, by acting
 partially as a foreign body and thus setting up mild chronic
 inflammation.

3rd. Grafts of skin, or derm act as centers for the
 proliferation of epithelial cells, and are very useful after
 the healthy granulation tissues is at a level with the edges.

4th. Grafts of skin or derm by forming separate centers
Sponge Graftings.

Table III.

<table>
<thead>
<tr>
<th>Case</th>
<th>Time of Sponge transformation</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>22 days</td>
<td>Sponge came away in part.</td>
</tr>
<tr>
<td>11</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>19</td>
<td>Ripped the 12th day, all removed.</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>28</td>
<td>He had symptom.</td>
</tr>
<tr>
<td>24</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>17</td>
<td>Partially removed. 8th day being wrong. He had symptom.</td>
</tr>
<tr>
<td>36</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>26</td>
<td>One third removed, per rectum following.</td>
</tr>
</tbody>
</table>

\[ \frac{12}{319} = 26.58 \]
for the reformation of epithelium, cause the ulcerated surface to become covered in by new epithelium much more rapidly, than if the epithelial regeneration were only allowed to take place from the margins of the sore.

Surgical grafts of skin or débris are important adjuvants to preliminary sponge grafting when the ulcerated surface is very large.

The one great necessity in healing by sponge grafting is to very carefully maintain its asepticity; and this can only be done, when the sponge surface is considerable, by very careful and complete irrigation with antiseptic lotions, and expressing from the sponge tissues all retained pus.

Of the 13 patients I operated with sponge, Numbers 13, 14, 15 and 30 suffered from sepptic absorption, and required the removal of the sponge with antiseptic treatment. In 2 others - No. 9 and 11, the sponge came away in great part, thus removing the liability to sepptic absorption, and the other 1 required to have the grafts removed occasionally as they exhibited tendencies to go wrong, by turning black or blackish colored, and smelling unpleasantly. Of the grafts over thin, this was rarely seen; if thick, was rarely absent.

As may be seen in Table Number III, the average time taken for complete transformation of all sponge tissue, so as to be non-describable was 26.38 days.

The longest time was in Case 24, where a man aged 46, with an ulcer of 12 years origin took 39 days.
for complete tissue digestion. The shortest, Number 32: A man aged 43, with only 17 days. His son was only 3 years standing, and healed very readily.

Of course, the thicker the grafts, the longer is required for organization, other things being equal. The technique I applied varied from 1/16 to 1/8 of an inch in thickness, and this seems to me about the best worthwhile size.

**Derm Grafting.**

This term, as used by me, meaning skin removed from a freshly amputated limb, or from a cadaver, is used. I was not aware the experiment of grafting skin from the dead on to the living had been tried, before my first attempt 11th September 1882.

**Case 10.** Post-operative investigations seem to prove that the Americans calculated this subject prior to myself.

In 1870. Mr. Cumberbatch proceeded in transplantsing skin grafts taken from a leg 14 hours after amputation.

In 1870. Mr. Mace was forewarned to substitute epidemic scales for true skin.

In 1871. (St. Louis Medical and Surgical Journal, Volume VIII, July) Dr. Rodgen transplanted dry epidermis
<table>
<thead>
<tr>
<th>Case</th>
<th>Source</th>
<th>Number</th>
<th>Crafts placed</th>
<th>Area</th>
<th>Time removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Cadaver</td>
<td>1</td>
<td>20</td>
<td>14</td>
<td>16 days</td>
</tr>
<tr>
<td>21</td>
<td>O</td>
<td>1</td>
<td>23</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>Amputated Leg</td>
<td>2</td>
<td>6</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>23</td>
<td>O</td>
<td>2</td>
<td>6</td>
<td>3</td>
<td>30 days</td>
</tr>
<tr>
<td>24</td>
<td>Cadaver</td>
<td>3</td>
<td>24</td>
<td>6</td>
<td>Same day</td>
</tr>
<tr>
<td>27</td>
<td>Amputated Leg</td>
<td>2</td>
<td>12</td>
<td>3</td>
<td>95</td>
</tr>
<tr>
<td>28</td>
<td>Cadaver</td>
<td>3</td>
<td>13</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>29</td>
<td>O</td>
<td>3</td>
<td>13</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>31</td>
<td>O</td>
<td>4</td>
<td>15</td>
<td>0</td>
<td>Same day</td>
</tr>
<tr>
<td>32</td>
<td>O</td>
<td>4</td>
<td>11</td>
<td>2</td>
<td>95</td>
</tr>
<tr>
<td>33</td>
<td>O</td>
<td>4</td>
<td>14</td>
<td>0</td>
<td>34 days</td>
</tr>
<tr>
<td>34</td>
<td>O</td>
<td>5</td>
<td>20</td>
<td>2</td>
<td>Same day</td>
</tr>
<tr>
<td>35</td>
<td>O</td>
<td>5</td>
<td>14</td>
<td>4</td>
<td>15</td>
</tr>
<tr>
<td>42</td>
<td>Amputated Leg</td>
<td>6</td>
<td>14</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>44</td>
<td>O</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>45</td>
<td>O</td>
<td>6</td>
<td>14</td>
<td>0</td>
<td>2 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>201</td>
<td></td>
<td>32</td>
</tr>
</tbody>
</table>
Scales from the thick cuticle of the foot, and he also used scales of detached epidermis, and they are reported to have proven.

In 1881— Dr. Britach of St. Louis Hospital, and Dr. E. Scudder, framed epidermis peeled from any part of the body, as well as cut-off grafts, successfully.

Epidermic scales and scrapings have been used in Scotland with varying success. Dr. Hobbs first tried epidermic scales singly, and similar results to the freezing of skin followed. Dr. G. H. B. Mackay repeated the experiments with opposite results.

The late Dr. H. C. Williamson in his Edinburgh graduation thesis, reports of skin being taken from a pig at Wakefield and grafted on a man.

He did not report that it grew.

My own efforts, as may be seen in Table V., comprise 15 cases; where, in 4, I did, 20 grafts, pure placed on these 15 mice, and of them only 5 grew in 8 patients.

Of the remaining 11 patients, 7 of grafts were applied, all went wrong, pulled away; but in 20 doing not one of my patients suffered any constitutional disturbance—true.

The discharge was found in these cases, sometimes turning the tined with dark, and in one instance—number 25, the discharge was offensive, but only in one.

The reason for this changes of the grafts seems to be, principally the length of time which had elapsed either before the lesion was removed from the body; or the length of time elapsing before it was put on the wound.

It seems interesting to note the influence occasional...
by the length of time elapsing between the death of the
owner of the skin and its application to the foot of a
second person, as affecting the growth of these grafts.

It is very interesting as affecting the question,
whether when life ceases in a person, if all the
atoms and component elements of that individual be
also dead? - Also, does death always
commence in one organ, or series of organs in a living
being, and proceed invariably the same course till
physiological death or decomposition ensue, and
violate the conditions required for cell life? - and
if so, Can we, by any known means of arresting
decomposition and physiological death by antiseptics or
otherwise, so preserve tissues, seed-like, that
they may retain their inherent vitality for a greater
or lesser period, requiring only the conditions of
suitable surrounding for their development and
growth? -

My experiments indicate that we may so
preserve these tissues - Case 27 - Where 2
grafts taken 90 days previously by Mr. Jonathan
Hutchinson, and kept by me at a body temperature
in a 1.5 to 20 Carabolic and Glycerine solution - 3
grafts grew faintly. They appeared as separate
spots on the fore and rear, and in these sites the
skin was thicker than where they grew not.

Case 23 - Where six grafts from the same
Cases were applied; three grew and formed islands on the granulations, though the burn was removed from the horse's leg for 30 days.

Case 16—To less certain—after the burn was 16 days removed; I placed 20 grafts on an ulcer, and up to the time of my departing for America, 21 days after, 4 grafts were discernable as thick out side and growing.

Cases 21 and 44—had the burn applied the second day after its removal. On the former 23 grafts were applied; 6 grew and formed a rapid cure. While of 14 grafts applied to Case 44—All sloughed, because they were kept in a solution of Permanganate of Potash, which formed a coating over them. I found it impossible to entirely remove this stain without great irritation; hence they were in some instances applied with this partial covering of Black Permanganite solution: therefore, as the granulations were interrupted in coming against the graft surface, it could not well be expected to grow.

Cases 25, 31, 36, 38, 42, and 44—six in all, had the burn applied to Ulcers the same day that it was removed from the subject. They total 80 grafts, of which only 16 grew. Of these 16—four came from Cases 44 and 44. The burn was carefully removed directly after the limb was amputated, it was placed in milk,
Alfred Vaughan — aged 42 — Admitted 8.12.83.

Ulcer near round the leg, and 5 inches up.

Grafted with Derm. 29.1.84

Photographed. 14.2.84.
and about five hours afterwards was placed on healthy healing cores, and then fixed inautomously (as indicated by the photographs taken afterwards) making bridges of new culture across the core, and continued to grow for a considerable time; one bridge of new epithelium increased to 3/4 inch wide; then repair seemed to last, and applications did not seem to stimulate, therefore I again grafted this core with fine, with the best result.

Case 442 Very quickly treated and strongly.

Cases 25 and 35, had perfectly 5 and 2 grafts from 18 in each case elypted away, therefore there was very great discharge, which could act injuriously to the forming grafts. In both a 1/2 inch removed and the result became a great error. The reason why? is not satisfactory.

Very clear the patients do not wish their cores healed, and therefore injure them. Case 25 did this. Case 35 is suspected: similarly, because once pined a similar result has followed when his core was nearly well.

In Case 31 the grafting was done on a surface previously subjected to sponge grafting: the stem would not grow; and in cases 25 and 35, white from 4 1/4 grafts 8 did satisfactorily, the resulting cicatrix was presence of such low vitality that it all broke down leaving the core as bad as ever.

Invariably where the grafts did not satisfactorily grow and produce proliferating epithelium, there is resulting in a lower form of product; viz., a thin film appeared binding.
down the frammelations, keeping them small and healthy, hence
they invariably the more perfectly healed by vaginal infection,
but the film itself did not appear to produce true epidermis.
Midway between the unsuccessful and the successful,
stands the "negative evidence." That no harm was in any
case done to any patient. Though 11 of these 10 patients
had their grafts undergo disintegration or skin exposure, and
very often, bleeding frammelations; and though, at times, the
graft was a long while removed from the cadaver, still not
one had symptoms in any patient appeared to incur thencefrom.
The only difference was—the discharge of pus from the
ear was greatly increased, but daily keeping the wound with
antiseptic lotions, in every case, was all sufficient.

Again—In no case did any patient object to its
application—rather the reverse—nearly all were anxious to be
selected for its application—whilst many patients would not
submit to skin grafting, and discharged themselves rather
than, as they termed it, "have their bodies mutilated."

The Successful Cases were 8 out of 10. The need
of succees varied from 1/3 proving as in Case 144, to 1/10,
there only 2 out of 20 applied from Case 35.

During the process of revitalisation of the grafts of donors
applied, invariably whether in Blood Clot or not, the epidermis
would slough all away in from 1 1/2 to 3 days. The grafts
then became permeated with capillaries pushed into it from
below, therefore it assumed the appearance very much of a
little kind of formulations, and often was not discernible for a time from them; so I found difficulty in giving the complete credit due to this method, because I would only habituate those grafts, visibly and undoubtedly growing, island-like, in the formulations where new vessels were to the grafting; and very often, by the time the graft, whose epidermis had sloughed, had again renewed their epidermis, the marginal skin had invaded the core, combined with the epidermis of the new graft, and so was pronounced and succeeded by me.

The mode of growth of each donor graft is identical with that termed "Skin Grafting", and when taken from the skin of the person of the race.

I have 2 successful patients of the total 15, great benefits ensued—viz.

Their scars were rapidly healed.

No pain was occasioned thereby, and no rest to life.

No irritation of their persons was needed.

The resulting cicatrices was very much stronger than had one been formed without any derm applied; this was frequently illustrated as in Case 144, where the site of the graft was indicated by a thickness, strong epidermis, long after complete revascularization had taken place.

Very little parts of importing constitutional malady was occasioned, because in all cases, only a very little of the papillary layer was retained on the graft. The epidermis always sloughed away before the graft took or independent action and growth.
<table>
<thead>
<tr>
<th>Case</th>
<th>Graft placed</th>
<th>Grew</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>6</td>
<td>Broke up but returned to work</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>14</td>
<td>5 days after from using Muller's branch</td>
</tr>
<tr>
<td>3</td>
<td>8</td>
<td>2</td>
<td>Discharged cured after six months</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>6</td>
<td>5 or 6</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>0</td>
<td>Very small graft</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>2</td>
<td>Not healed. Epidermis of graft sloughed</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
<td>2</td>
<td>Margins divided with pricking graft</td>
</tr>
<tr>
<td>10</td>
<td>21</td>
<td>16</td>
<td>Private patient</td>
</tr>
<tr>
<td>18</td>
<td>6</td>
<td>0</td>
<td>Twenty epidermis used. 4th grafting</td>
</tr>
<tr>
<td>37</td>
<td>9</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>18</td>
<td>10</td>
<td>Gutta percha produced cysts</td>
</tr>
<tr>
<td>39</td>
<td>1</td>
<td>1</td>
<td>Little epidermis sloughing, and little discharge</td>
</tr>
<tr>
<td>40</td>
<td>10</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>141</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>143</td>
<td>6</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>153</strong></td>
<td><strong>94</strong></td>
<td></td>
</tr>
</tbody>
</table>
Skin Grafting.

On this subject, applied as meaning taking skin from the living individual, and placing it again on the living person, I feel I have little fresh to add.

The known history of skin grafting I have treated under Best Grafting.

The most suitable cases for treating by this method I have mentioned, as also the Modus Operandi.

The process of treating by Skin Grafting I have also alluded to.

I have tried skin grafting on 16 patients, in each case taking the skin from one of the subcutaneous muscles, in one or two pieces, and then subdividing them into several small pieces for grafting. At first I used M. Mathieu's scissors for removing the skin, but owing to the slender nature of the instrument, and its liability to break, the tiny portion of skin obtainable, and the consequent number of times the limited place of my patients' backs had to be drawn upon to produce, say 20 graft pieces. Also to prevent the having so many small pores on the patient, I discontinued the use of these by Mathieu's scissors, and substituted an ordinary pair of curved scissors to take away the required amount of skin, which I elevated by cutting in an ordinary pair of artery forceps, and then slicing off the required amount.

The skin removed, as far as possible, only went down far enough to include the Rete Malphigi, . Immediately
Robert Lloyd. 29. Admitted 10th October 1881.
Ulcer, size 14 inches by 5 inches.
Grafted with skin 28th November 1881.
Photographed 12th April 1882.
Immediately on its removal, no bleeding usually appeared, but only a dry white coating; but invariably a few minutes after, the blood would suddenly rise, but a little lint and bandage sufficed to stop this bleeding.

The manner of applying these grafts has been previously discussed.

On the 15 more 15 3 grafts were placed; and of them, 71 grew unanimously and aided the ulcer repair. Out of my best patients, where 16 out of 21 grafts grew, occurred a private patient, well named--Case 10--where an intractable burn of 7 years standing resisted all treatment, by the influence of grafting and rest and special treatment, in 42 days was completely healed, and now continues healed.

Case 5--perhaps better--A very nice, suffering with Bright's disease and consequent atrophy of his legs, had 10 grafts placed on his are, which had existed 14 months. They all grew, and in 115 days quite healed the sores, and though as a whole--he was small to start for customs, or to bear dissatisfaction, one express themselves--he died, badly, from the want of in the poorhouse, with the cating held very firm.

He was again admitted, 8th April 1884 into our Infirmary, and after 47 days post with diuretic medicine his atrophy of the legs was greatly improved, then I had the accompanying photograph taken. It will show the strain put upon the cating, joined by these grafts, and how firmly
it continues to hold.

In three of my Cases, Numbers 3, 7, and 8—the number of grafts out of the 22 applied that grew, is not stated. There was some doubt in each case how many precisely did grow. Therefore the number is omitted. But the results are.

Number 3 was a second grafting of an old intractile ulcer of 7 years existence, when I placed the grafts in blood clot, then it healed within two months, though 1½ inches by 1½ inches in extent. The first time, six grafts were applied without any blood clot, then four grew, but owing to the application afterwards of too strong a solution of Lead lotion, the new grafts and tissue sloughed away.

Numbers 7 and 8 were the two feet of a patient first bitten, and where all the toes sloughed away. The grafts here did grow, aided by their enveloping blood clot, and the patient was discharged after 61 days quite cured, though the areas where grafted extended 3½ inches by 2 inches, and 3½ inches by 1½ inches respectively.

It is interesting to note in Case 1, that though the cicatrix gave way after the patient returned to every day life as a dock labourer. Yet he states the cicatrix broke away by degrees, the new part formed by epithelial regeneration and invasion being first, it being thickest, and the grafts remained, though they afterwards sloughed away.
Case 18 is very interesting - it was my fourth attempt at freezing a very obstinate case, where only early aspirations of epithelium were applied, and not including the papillary layer. Bone grew - all six sloughed away in 13 days.
Concluding Summary.

There are several essential conditions modifying tissue repair. I desired to treat of these, such as—

The absolute necessity of maintaining the activity of the wound and parts, especially those, which is so apt to retain reactions from the wound itself, they become useless if the least care be not used.

The necessity of rest in the prone, and the advantages of obtaining blood pressure in the formalations by using blocks to elevate the foot of the bed containing the patient.

The advantages of equal and constant pressure to the true limit; as well as, I find, by a good elastic elastic ribbon bandage applying—

The difficulties following the loss of adjacent flaccid tissues that cannot be drawn up.

The great necessity for a suitable diet with such patients, to overcome one factor, I imagine, producing these pains, viz. malnutrition.

Where there is any peculiar achiaetic or degenerative peculiar to the patient, to try and remedy it by therapeutic means.

To consider tissue repair not in a single healing wound.

But I fear that the already tedious length of my paper must prevent such being considered; and
it will require my briefly summing up the results I arrive at after my many experiments.

It appears, then, looking at Table number 1 that grafting, a granulating sore, when in a proper state, is of unquestionable value, and is called for in every case where the surface involved of epithelium is either large, or slow of healing. We note that in nearly every case mentioned, in that Table, that whereas the ulcer before treatment existed for years, it can easily be covered in days how long after grafting was required for complete cure: then such a result could not have taken place without grafting.

As to the kind of graft—rope will not form epithelium. It will replace lost tissues; will lead up granulations and connate tissue to fill any rational sized cavity produced by previous destruction.

Will indirectly promote epithelial marginal growth, because it acts as a stimulus to the wound generally; assisted, no doubt, by the extra cure the patient will take of his food when such transformation is in progress.

Tissue will undoubtedly grow in many instances as a proper core—it will form epithelium, and is, I think, of the greatest value when the patient objects to his own skin being used, where he does not mind that taken from an amputated limb for a cadaver.

I do not like the idea of utilizing the dead to insinuate the living, hence having satisfied myself,
as to the possibility of this grafting - I purpose discarding the practice and seeing that the patient get nourishment from congealing substances recently performed, presenting it as long as possible, vitalized, in a perfect condition and a body temperature.

Skin from the same patient is undoubtedly best when it is allowed. This can be done by any method. Transmissions. This is invariably the best interest for the infected skin. It forms wonderfully, and much more successfully than does.

The resulting cicatricial is the strongest of all, and will open to as strong, or stronger (like this rustling medium in some fractured bones) than the original tissue.

And I have tried to prove that the Reto Malphigii is the essential in the latter two kinds of grafting. Epidermis alone is useless. Both will slough away when placed on the granulations. And the epidermis of a skin graft will invariably slough if there is much discharge from the granulations. And granulations discharging much are specially unhealthy, and do not do activity take on attachments to the grafts.

That placing the graft in Blood Clot is of undoubted value, because it just acts as a cement to keep the grafts and granulations sufficiently long in
contact to promote vital activity.

Secondly - because the blood clot is organised by plate-coagulum, and it is only by the clot becoming organised that it can grow; therefore the clot acts as an intermediate and an introduction to the foundations to act upon the graft and promote its growth.

It would seem also that the better nourished the patient, the better are the results obtained. This may seem rational. And as all my patients (excepting Case 10) were jaunty, therefore badly-nourished. I should quite expect that were similar careful attempts made upon well-conditioned patients, with either ham or liver, or both, better results than these would be obtained.
NOTES

on
Ulcer Grafting
by
SPONGE DERM AND SKIN.

45 Cases treated.

for
Graduation Thesis,
by
P.W. Perkins Case M.B.
1884.
Joseph Francis, aged 40, had a large ulcer in the lower third of part of his right leg. It was of many years standing.

Since 1881, it extended 3½ inches around his leg, and 5½ inches from above downwards. It was then in a fairly healthy, healing state.

**Treatment**

The large piece of skin was taken from the junction of his left-bellowed muscles, cutting that side of the centre oval and this large piece was subdivided into smaller pieces. Each part about the size of half a split pea; they were placed in two rows upon the ulcer, each piece being held in position by strips of linen adhesive plaster. Each strip of plaster having a second strip attached to its centre, plaster to plaster, over it passed over the grafts, thus giving to these grafts a linen surface, instead of presenting the adhesive side. Cottonoid bandage was applied, and the dressings not removed for two days and a half—then dried every second day. Six grafts took well—two did not. They continued to grow well until he discharged himself the following August. All his sore healing rapidly.

**Result**

12 grafts—6 grew, 6 did not.

Saw this patient the 10th October 1881, he informed me he went to work after leaving the Infirmary, & that he noted the grafts get smaller & less distinct, as he was unable to be carefully bandage it, as in the Infirmary; and that this center seems to be the last to disappear.
Elizabeth Taylor, aged 55. Seamstress, was admitted 1899 with a large ulcer on the lower third of her right leg.

**History.** It has been an open sore over 5 years. She has been to several hospitals but has never had her ulcer cured.

**Present State** since 1891. It was an elongated sore, over the right tibia and interosseous region, extending from 1 inch above an imaginary line drawn from the tip of the external malleolus to the tip of the external malleolus, 1 1/2 inches from below upwards, 1 1/2 inch wide at its lower part, 1 1/2 inches above.

Six grafts of skin, taken in one piece from her left arm, subdivided, were placed on the sore as Case I and similarly treated. Four weeks, and in two months the ulcer was reduced to 1 inch by 1 inch, the Lister Plumbi Tinct. Aqua Tinct. was applied and a dressing bandage, and two days afterwards all the four grafts and wound had taken down, and its por was as large as before.

**Second Grafting September 1891.** Eight grafts were inserted, now the formations were paralleled till they bed slightly, and the grafts placed on the paralleled part, and surrounded by a very little blood. Oil's with was used, and Lister Plumbi Tinct. was applied. The second day the dressings were removed and all looked satisfactory, dressed after every second day, and by the 4th December, it was quite healed.

**Result.** Healed after 5 years previous resistance to all treatment.
Case III  
Skin Grafting

James Wilson had an ulcer on the lower part of his leg, 2 inches from above downwards, and 1 1/2 inches around the leg — in June 1881. The sore was granulating well, healthy-looking. A piece of skin was taken from his arm, subdivided into 8 pieces and placed on the sore. On the 9th plus post, patient was kept persistently in bed, and after about five months he was discharged cured.

Result: Discharged cured — 8 grafts — Grew.

Case II  
Skin Grafting

Robert Lloyd, aged 29. — A deep cut in the back of the left leg, was admitted 10th October 1881 with an old Phagedenic, ulcers, ulcer on the left leg.

Scab. It was caused by the bite of a dog 4 months previously, it increased in size with its.

Recent State: 23rd November — how the sore is about 3 inches above the malleolar bone on his left leg, 4 inches from above downward, and 1 1/2 inches across, margins, healthy and invading; granulations small & of a bright red colour.

16 grafts were applied as former cases. It corroded with leaden lotion, old silk lint, 1/2 —

25th. Outed for the first time, grafts well adhering. Some appear...
to have capillaries running into them through the attaching blood clot, which appears organizing.

8th Dec. — Operated on 5th day. Appearance marked each time. Swells present, 6 mm. prof. of the wound has surmounted by new epidermis. Another 1 mm. centre of three times its original size, and one near the bottom has gone. 3/4 inch, extending from it.

— General health good.

13th Dec. — Leg now quite healed. The graft have all enucleated with the marginal skin. The edge of the graft has thicker skin than that between these skin. Patient was set up daily.

14th Dec. — All dressing stopped. Only twice before applied over the surface daily, to be a slight protection while the cutis from stickier.

15th Dec. — Discharged with a very firm cicatrix.

Result — 10 grafts all took.

Case VI.  
Skin Grafting.


History — 2 years ago, in addition to acidity, he had adenitis paroel, and pit months after, his leg was jucensed. Speculated but pus was formed. These juices stopped forming a pore which has never since healed. He has attended several hospitals with only slight benefit.
Present State. The ulcer on the front of the left instep is half filled in a few above downwards; it's around, enlarging downwards and sideways. It was treated by palating, 20th Dec. 10th

15th March. 16 very small grafts were placed on the granulations after each one felt had been partly excised with a little blood flowed from a coagulum, and if this the graft placed, dripping cold milk. Suit. Jutta Riddell attended and damaged lotion.

17th April considerable discharge having a smell: all grafts are in position, but their external covering dry and apparently breaking down.

19th April. Discharge, grafts appear softer and much smaller.

21st April. All epidermic portions gone, and only a few crumbs mark the situation of each graft. The whole ulcer presented appears congested, as though due to increased action and vascularity.

Result. Of 16 grafts three took.

Cases VII and VIII. Skin Grafting.

Ann Moore, aged 25. Single, seamstress, admitted 14th Feb. 1891, in a very fit, destitute condition, stating she had been exposed to the violence of a severe snowstorm last previous, and passed two nights sleeping under archways.

Present State. Anemic nature of very poor. Her feet black, with third toe. She has no power of movement of the lower limbs. toes fixed.—She appears much altered.
Treatment. 30th September PR. How her bodily condition has greatly improved, the pain just below have sloughed away from both feet - the right foot for the head of the middle-lateral bone of the great toe to one inch below the head of the fifth middle-lateral bone; but the plantar muscles was not so extensively sloughed as the dorsal bundles and interosseous. They looked the left foot - slightly less. 20th January PR. she came under my care -

23rd. 1 graft was placed at the right foot - 11... left foot - each graft having a well prepared for it by previously slightly scratching the granulations till they bled enough to form a blood clot in which to place each graft. They were taped in position by strips of adhesive plaster as in Case 1.

27th. Draped every second day, most of grafts have their epidermic surfaces breaking down, but their base part the hand become attached to the coagulated blood, which seems becoming organized.

31st. grafts appear very small indeed; not so distinct because of their upper skin surfaces having sloughed away, and their lower surfaces becoming invaded with capillary blood.

10th February - grafts doing well, new forming with islands of individual epidermic growth.

1st March. - 12th foot quite well, the new skin appears very thin but firm.

25th March. Recharged quite cured.

Result - of 16 grafts - those growing uncertain.
Case IX.

Sponge Grafting.

John Clarke, aged 62. A blind beggar was my first patient to try sponge grafting on, because he had an outlying leg and ulcer, and, of course, could not see my 'Modus Operandi.' He was admitted 8th June 1892, with a large ulcer on his right leg.

History. He has been a blind beggar for many years. He has been very much exposed. His ulcers were caused 23 years ago, and pins have been used longer than three months at any time. Ulcers have now been open over six months.

Present State. About five inches above a malleolar line on the front of his right leg were three irregular ulcers, very dirty and discharging very slowly.

Treatment. 20th June: All three ulcers had wound with sponge graft. (The sponge prepared as recommended by Professor Hamilton in the Edinburgh Medical Journal)

All the ulcers had been scratched till blood flowed slightly. Largest ulcer was about 2 inches square.

Lesser " " entzigenous, measured 1/4 inches by 1/4.

Least " " about the size and shape of a jenny -

Splints were Semins' 

S. J. Bandages, (similar to Catholic gauze), and a white elastic bandage.

30th. The ulcers were considerably packed with dispense, in places removing the corrosion from the graft. Ranking last.

All the sponge adhering still, excepting the lower ulcer, where it had chipped down. I was partly overlapping the margins, but even
the blood clot has acted as a current and produced a good union.

The cavities of the grafted tissue filled with coagulum — each graft's center was turned red in colour, whilst the margins were grey and matte. Slightly raised, these margins did not cause bleeding.

14th July — the grafted came away from the edges of the ulcer, causing enough hemorrhage, to run over the edge of the ulcer —

6th... The grafted came away in my great part from the smaller round leaving a complete epithelial covering below — it appeared to quite greater activity in the granulations, & perhaps incorporate some of its substance & to use the other as a protection, similar to healing by scabbing — The ulcer points are much smaller.

12th Some of the grafted parts have come away attached to the dressings, leaving small granules attached to the granulations of the size of a mustard seed. There has been considerable marginal growth.

13th be grafted discernible.

22nd July — All the ulcers are quite healed. The largest was the last to heal, now is covered by clean papilled ectes.

The least are covered with healthy looking skin.

Result. Since ulcers cured by grafted grafting in 22 days treatment.
Case X  

Skin Grafting.

Mr. S., a private patient, aged 47. 

History: Seven years ago, in trying to put out a fire caused by paraffine, he got a burned burn on his right leg. It extended considerably up and down the leg, but healed upon a line 4½ inches from above downwards, and 5½ inches around. After this period, it resisted all treatment.

Treatment: 6 April 1892. The foot was of the above type, not discharging blood, but having somewhat callous edges. 

21 grafts taken on one piece from his upper arm, each about the size of half a fold, were placed on the scarred portion along a little blood clot and Samita Arzepsa. — old oil, Samita Pungo, Butea Durwa Indians and a bandage. 

26th May — 16 grafts heals better still. The wound is now reduced to a square of 1½ inches. The grafts are well reddened and the surface, but some have united with the edges. 

7th July — it is now 13 weeks since my operation. He has attended his shops since the end of May, gradually increasing his standing and working. He is now able to go, and stands behind his counter nearly all day. The sore is about the size of a pea, with ridges, thin, healing edges.

This pore in states was caused by rubbing off one of the Epidermic flakes covering the foot. Previously, it was quite healed. Not now looks scaly, deformed swelling. 

Result: 20 days cured 16 grafts, taking 21 days.
Julia Brisker, aged 30. First case of 4th June 1891. Right leg, has been discharging very much.

History: It was caused by a kick 7 years ago, and has never been healed. 5 years ago a large blood vessel burst in it that was grafted to her. She has been in several hospitals.

Present State: On admission it had callous looking skin, greenishaceous, the discharge: she was placed in bed, the leg bandaged.

28 June: The prodromus much healthier, and is healing slightly.
No position is over the lower part of the limb and partly anterior, extending 2 inches from above downwards, and 5 inches across the leg.

28 July: Graft, laid along the edge of a shilling were applied. The pneumocele being sutured, the slight bleeding ceased, and in

20th June: Arterial, great discharge, slightly offensive, soaking the dressings. Grafts all adherent, and filled with clot, clotted in the center than peripherally. The grafts are what they think.

2nd July: Great discharge, again coating the edge of gauze - the graft came away, leaving a non bleeding surface, but small

10th: Discharge now decreasing, using rubbing to solution of argent (What's a 2/2) end. The inner part of the graft has

18th: No gonorrhea discernible, but still with very slight ascendent, this and slight chills, shallow, walls, small cell present, Calum invading, well.
29th August - She discharged herself, wishing to see her soldiers on or before departure to Egypt - This she considers more important than any sponge grafting. Ulcer was considerably smaller, the marginal portion having contracted and the sponge still - the pale film mentioned did not yet want to thicken, nor produce epidemics. Result: Discharged before quite healed.

Cases XII and XIII. Sponge Grafting.

William Elliott, aged 37. A sailor, was admitted 21 June 83, having an ulcer on each leg.

History - born a little money, then drinking it away; then begins again. Lathing is a travelling thresher.

Present State - So very ameliorated. Blanching. His ulcers had not been cleansed for 3 days, hence they are small.

The Right Ulcer is over the middle third of the tibia, extending 1½ inches from above downwards, and 5 inches across. It was caused 5 years ago by his being struck with a brick. The sore produced has never since healed. Below the ulcer there is a great thinning of the periosteum, causing an elevation below, and partly around the wound, looking as though there was elevation partly and above the site of a badly united fracture, but this is not so.

The Left Leg has two smaller ulcers in its middle third anteriorly, extending 2½ inches from above downwards, and 2½ inches across.
A second smaller ulcer about the size of half a crown was inferior and posterior to it. All these three were discharging considerably.

11 July — After elevating the surface, all were covered with gauze. Then oil and nitro instead of gauze was placed upon the gauze.

15th Considerable discharge penetrating the outer bandage. The gauze has its centers filled with clot; their edges appear like straw colored jelly, being transformed away; they seem much thinner than their centers.

17th Smaller wound on the left leg is well. It is covered just a thin yellowish white scab. The center ulcers are healing rapidly. Each graft seems to marked sponge tissue at their centers, having a jelly looking, organizing gum around the borders.

20th The central ulcer is rising up and covering the thinned sponge edge. Where it is not adjacent to the margin, the outer edge of sponge gets a brighter red, formations of a healthy kind appear, and invades centrifugally; the center has lost its sponge like aspect, it follows the curve of the margins. Sides of the left remaining ulcer is dark reddish, varying from the size of a pea to that of half a bean — it may be due to pressure from a flax, placed on his leg 5 years ago at University Hospital, but did not then grow.

29th Scratching the remaining grafts, they bleed. Very little as sponge was removed, only a film & it is semi-transparent; all the ulcer had organized. Right ulcer 1/2 by 1/2 inch — Left ulcer — edge of suppurate — He wished for his discharge tomorrow.

Result: Sponge reach all organized. Ulcers much smaller.
Case XIV.
Sponge grafting an old burn.

Patient: Head, aged 15. Admitted 12 July 82. Has her large scar on her right arm.

History: 3 years ago, her dress caught fire, and burnt her severely, especially on her arms; all the burns are very well draining, on the right arm two scars remain, and have not decreased for two years. All around it is cicatricial.

The burn extended from about 2 inches below the shoulder to the upper part of the hand. Her right arm is smaller and shorter than her left.

Treatment: (The measurements of the first case, treated are not given.) 21st July: Both arms covered with gauze as before, continued. Topical Oil of Vitri, Sante Fange, Bandage, Tidying.

22nd: Gauze very thick - Mitchell has passed this the draping.

23rd: Gauze increased thick in parts, looks healthy & organizing, I pared down its upper surface. It was black looking & paler.

24th: Sante Fange, Bandaging very offensive - Ameliorate sore by great erythema. Patient has temperature 104° ½, pulse 120. Rigors returned last night - Considerable constitutional disturbance. Sent away the sponge causing it to bleed freely, applied Charcoal Pasteur, Tonic Saline - 9th. All the pyramidal symptoms are gone - big small petrola of sponges remain after 3 days past these.

15th: Slight return of rigors & erythema. Temp 100°. Sante Fange continued.

20th: Abscess at the wrist opened - Burns was healing.
The hollow of the larger sore has filled up by granulations. The smaller wound at the elbow is about ½ inch long by ¾ inch wide.

20th: Sin at the elbow has healed. A second abscess has formed at the wrist.

30th: The two abscesses appear to form from a mass of chronic subcutaneous tissue.

21st: September - Ulcer was much smaller, but is not healing as fast as formerly.

23rd: Her brother was so pleased with the diminished ulcer, he cured her with her own secret. 

Result - Gangrene profiting. heat on the wound remains unrelenting. Pus accident symptoms increasing. Great improvement to patient.

Cases XVI, XVII, XVIII, XXI. Sponge, Derm, & Skin.
9th August 1862: This pupil on the left leg is fairly clean, middle shaped, 6 inches above a kneelator line, is 6 inches around the leg, about 2½ from above down and 2 each side, and 1½ inches over the heel; its edges are smooth, thick, hard, and callous looking. The marginal stain is purplish, hard and slightly elevated. To-day the podal surface was paralleled all third fluid, and the surface quite smooth. With sponge, cold with next, t salines dressing, put on elastic bandage.

13th: Drained daily—some of the purplish cut down and abscesses. The sanguineous came considerable few from the sponge substituted to be pressed on. It amounts to—Patient—think this leg is going wrong. It is not complain of dressing around the leg. He has considerable malaise, and swelling at the point. I removed one third of the sponge, which caused free hemorrhage. 21st: Daily careful dressing, removing all abscessed fluid. It pressed has removed the malaise.

26th: Sponge nearly disappeared over the whole injured, organization commenced for its base squared upwards. The margins and the first to disappear. General repair is more evident.

1st September: The surface of the scar seems to have levelled up. The marginal stain again feels less painful, nor sponge appears. Two leads found relief.

Second Grafting—Derm or Skin from a Cadaver.

11th: The edges of the suffer now appear healthy and growing fairly inward. The granulations look healthier, keep sterile lasts. To-day 20 grafts from Case 1 was placed over the surface of the wound, each placed at slightly
bleeding granulations. They varied from 1/16 to 1/8 inch wide, and
from 1/4 to 1/2 inch long. They hurt the patient at stool time.
Some were placed with their epidermic surfaces upward, some fell
on their sides. Scratching the old epidermis profusely caused
distinct pain. It states, there is more active movement in the
leg than for years past."

21st. The old eschar has been blackened daily. Discharge
considerable & decidedly offensive. Big grafts only appear,
no dead blackened surfaces as yet, their upper parts would
seem through. A very thin eschar is showing on various outer
of the grafts that are free. The margins are growing well.

30th. Left for America. It appears growing slightly.

31st. Returned & found no trace of grafts, and the
wound again nearly covering his leg.

Third Grafting. Sponge.

17th. Having similar measurement as the first
grafted, I placed sponge over only about half over the sore
in the usual third. 57 grafts as before.

8th. Fracture, discharge, smells badly, burns the old eschar
Black.

9th. Began turning droppings infected matter. Sponge is
being steadily transformed. The edges are growing upwards.

20th. Feb. Very little sponge discernable, but only as tiny
islands of homogenized pale yellowish jelly. Some of the
thicker grafts had to be pared down. The margins of skin
are letting 2 or 3 Pratt pretty quickly & invading very slowly.

Fourth Grafting. Skin. Epidermic part only.

21st. February. Lay small pieces of Pratt letting skin
The ulcer's margin was removed (the removal of nearly all caused bleeding) and placed, graft-like, on the ulcer's surface after scratching.

24th. He had left hospital bed. Graft just viable.

6th March. All grafts are quite good. The ulcers are growing better - Philibert followed.


Fourth. Grafting. Derm. or Skin from a Cadaver.

14th April - Ulcer has a callous look, but the fringe present and nearly all gone from the margin. The granulations appear ghastly, large vessels. The eye about as the first graft.

I placed 18 grafts from Case III (a dead child 3 days old) on the bleeding ulcer, each graft being about 1/4 to 1/8 wide, and 1/8 long. Thus the whole derma.

12th. Grafts have nearly all sloughed. There is first discharge, this vaginal ulcer seems preceded by bronchitis. It seems to slough away quicker than the ulcer from an adult.

19th. Superficial & local inflammation following. The flanks of his leg are very enlarged. Nodules are applied. Medicine given.

30th. Patient's health very good - he discharged himself.

2nd November 92. Patient readmitted with his leg very much worse. Tender, Tendons, Man to has elongated the had very little movement of his toes or the left leg.

He gradually got worse & died 5th December 1893.

Post Mortem not on site.
Post mortem note 6 December 1884. in breast breastbone.

Body lusty, nourished and not injected. Below the wound was very hard and cutaneous. The surrounding skin was congested, turgid, in colour. Just around the wound the skin was slightly raised, but 1/2 inch distant was very firmly atretic.

Scars of pus had formed below the marginal skin, causing its oedema.

Saphenous veins - Internally pro normal 1/2 inches above, but obliterated before reaching the ulcer surface. Below the ulcer it was very congested. Glands had above it, the only bridge of tissue about 1/4 inch wide, which intercepted the ulcer for going quite round. Very small abscess below this bridge, below it also very congested.

Fascia - About one the ulcer site, tightly adherent to the skin round the abscess. About 1/2 inch away, above was a layer of fatty tissue, blue rose, by the fascia hypertrophic, to nearly 3/4 inch as the anterior anterior digastric.

Skeletal Anterior - Tender for 3 inches entirely through.

Anterior Longus digitorum - Similar, keeping the tender to the act of.

Anterior Tibial head - heavily eroded away at the wound.

... Antler Ten - Antler thickened - vein dilated & containing blood, semi fluidified - his clot. There was great congestion.

Dorsal Longus hallucis - nearly eroded through.

Psoas Major Antler Ten - passed also under the only bridge of tissue and near the vein had very anastomotic

Psoas muscle normal - thin incised and divided.

Foot: it had a hole like small extending into the wound, it was black, forms looking -
Case XX.

Sponge grafting.

Ellen Crowley - aged 55. Woman. Chancesman was admitted 1st August 1882 with a large, firm, discharging ulcer on her right leg.

History: 30 years ago this ulcerated the skin of this right shin producing a can; she thinks she deep from her clothing, poisoned this wound, causing it to be a large ulcer; since then it has been healed and again re-formed about seven times. It has now been untouched 3 years.

Habits: Pretty steady - sometimes feels drunk.

Treatment: 21st August - She has now two from the lower third of her right shin. The larger is irregularly triangular, and measures about 1 1/2 inches each way. The smaller is about the size of half a crown. The purges of last were punctured by a fine stick they bled. The prepared sponge about 1/2 inch thick was applied all over.

23rd Great discharge. The transforming jelly like matters well noticeable. This dressing, old salt, Sante Sampson, 70.

11th September - The base wound prepared is now covered with thin, pale brown, white cuticle, covering one about as large as half a piece of sponge, appears, island like, on its surface. This sponge is being invaded by cuticles. Patient kept in bed. The sponge texture may still be seen by the unaided eye, & of the jelly like character.

18th Result - Quite healed.
Case XXI.  Derm or Skin from a Cadaver.

John Clarke (Case IX) admitted 9th August 1892.

History — He states his son (previously operated with syphilis) kept well seven days, whilst he continued walking very much in his professional career as a Beagare. He kept the same rap from his leg all the time, and did not resent the stroke of the first day; then small blisters appeared, which speedily broke, ran together, and in seven days after his son extended from the root across by 3-4 inches from above clavicles.

An admission. The entire was seen. The subcutaneous surface yellow and elevated, and cut the mental behaved about 29th August. Treatment — Ulcer very vascular, then easily. After healthy and invading — 13 grafts from a cadaver (removed two days ago) and each cut about 1/8 inch long were placed irregularly on the stretched foundations — stitching, old silk. Very great difficulties were experienced in determining whether was the lower surface of the skin after its minute separation, but, very probably, all were not placed with the epidermis forward. The skin cut with a hard cutting portion.

3rd Sep. 15 grafts at first raw organizing, some and being incorporated with the epidermis. Very considerable discharge and slightly offensive.

15th 6 grafts disseminated, 2 came away in the bandage. There 6 have a reddish point gone amount that margin. Result discharged quite healthy.

22nd Not — Clarke removed with 1/8th inch his leg remains strong.
Case XXII  Derm or Skin Grafting.

John Gardner, aged 52.Labourer was admitted 4th August 32 with a burn below his right knee.

History. It was caused by his falling asleep before a fire, and thus remaining for two hours. His trousers were not then burned through, but his leg and knee were very sore. He was admitted here about a week after.

Present State. 24th November. A very large pore, one and a half inches in diameter, has been produced by sloughing of the tissues. The incision, promising, and has contracted somewhat.

This graft of skin from Case II, was placed on 7th Janr. I did not wet the surface enough, burned tissue was very little bleed where the grafts were placed. 10th Janr. Not well healing and took off.

26th. Sutures of penruin from the graft, very slightly catarchic.

15th. 17th. Graft not well wanted - a thin skin, like film, covers the right side of the ulcer. Healing marginally.

1st Feb. 2nd healed. The graft, as such, has not appeared well on the surface, but in place of catarrh a thin film appeared, which may have accelerated the healing.

Result. 4th Feb discharged well - 6 derm grafts used.
Case XXIII. Derm Grafting.

Jengo Hall, aged 14y. Labourer, was admitted 14th November 92. with two large burns on his left leg.

History: Patient fell asleep before fire and burnt the back of his left leg. He felt nothing of it till awaking, it was only a little sore, but on his coming into the ward from his bed he experienced severe pain. His fractures were closed.

Present State: Has two burns close together about 2 inches below the knee posteriorly - Their superficial area is about 2 inches square.

12th Dec: Two grafts from Case II were placed in the burn, which has now a very healthy look. The granulations are small and compact. They bleed more freely when touched than Case 22. -- Describing as usual.

14th: 5 grafts adhering well in their third clot, as appears to be becoming organized. The grafts came away in the dressing.

18th: Grafts are distinctly discernible, though their upper surfaces have not chaffed. A slight film covers one corner of the place.

20th: Healing very rapid, especially at the margins - Three small flakes, Island like, in the center of the cone have reached the position of the grafts.

21st Jan: -- Burn quite healed, though the coming away of the grafts appears thin - the grafts adhered well, and gradually united with the surrounding margins, very imperfectly.

Result: 6th graft, 5 adhered, 6th . Burn healing.
Case XXIV.  

Sponge Grafting.

Mary A. Davis, aged 37, lodger, was admitted 22nd Nov. 1882, with a conuloid chip and paresis in the lower third of her right leg anteriorly.

History. 5 years ago she fell down stairs & injured her shin. The abrasion thus caused was healing.

Present State. The jetty state existing a hundred days has now very greatly improved. The site is about 4 inches above a malleolar line on the right leg, extending 1/2 inches from above downwards, and 3/4 around the leg. The base of surface is clean, with healthy small granulations, & a nice invading margin.

18th January 1882. I scratched lightly the surface and placed sponge irregularly over about 3/4 of the entire defect as usual.

22nd. The sponge is becoming very glutinous and transformed.

02nd. Feb. - Very little sponge as yet, much remains, only little masses of yellowish jelly lasting, material.

26th. The sponge has quite disappeared, but two cuticles later its place. The ulcer has a filled-up, granular base, but incised only from the sides.

16th March. Increased very marginally, and it very slow.

Case XXV.  

Derm Grafting.

14th April. - The ulcer has now a clean granular surface, showing no signs of sponge, two cuticles but the marginal small.

24th April. From Case III were placed on the lower...
extending 3 inches from above downward, and two inches across.

On scratching the granulations for planting my grafts, there was much greater hemorrhage from those at the margins, than those at the center. The pain was felt at the scratching.

9th - Grafts are healing considerably.

10th - Patient unfortunately put his arm severely with cotton wool at his daily cleansing it.

12th - Big grafts are showing as thin fleshy of skin about as large as half mustard seed on the round surface; they appear flat and contracting at the granulation surface.

14th April - Considerable discharge of an offensive nature. Patient keptcontinuously in bed. Several pale elevated granulations are appearing.

24th - These pale patches now appear more defined, and like epidermis, they are nearly white. I did not parallel them.

14th May - Retarded condition. A second ulcer is appearing.

16th - The two ulcers have united. The other grafts dissolved away, but the area now filling them again. Classie bandages to now were applied.

Result: - Some grafts all transformed with no bad symptoms of 26 donor grafts, 6 both grew, but had too quickly died ax.
Case XXVI

Mr. Barker, aged 46, was admitted 6th January 1893 with an ulcer of his left leg.

History. 12 years ago he had suppuration in this leg which caused a break of surface. It has quite healed three times since then. The longest period it remained whole being four months. Being a boat labourer, has often been without food for considerable periods. Has never had syphilis.

Present State. On his left leg about 4 inches above a malleolar line, and on the inner surface of the tibia, an ulcer extends 2½ inches from above downward and 1½ inches below. A little above and external to the former is a smaller about ¾ inch square. Both have healthy surfaces and healing edges. All around the front of the leg the surface is squamous, with dirty-looking scales.

10th January - Having scratched their doses on the bland I placed sponges on nearly the whole surface. Then I dropped.

16th. The grafts are adhering firmly and becoming organised.

The outer fleshy portion causing slight dermatitis was not used.

22nd. Some of the outer grafts are undermined by ingrowing marginal skin and slowly removed. The central parts of the sponges are being transformed. Repair seems very active.

1st February - All sponges since has become organised.

The epidermis has taken its place. The foot relapsed the end of the month, due, it is believed, to malnutrition by Barker, who did not wish to go on.

10th May - Discharged well. Result.
Case XXVII.

Joseph Thomas, aged 33, Labourer, was admitted 31st January 193. with a large circular ulcer on his left leg.

History: It was caused by the pulling of his boot 3 years ago, and has never since healed.

Present State: On the outside of the left leg, 2 1/4 inches above the line of the external malleolus, is an irregularly triangular ulcer, 3 1/2 inches from above downwards, and varying from 1 3/4 inches to 2 1/2 across, the edge being downward. Its surface at admission was very dry and sloughy. 3rd February, it is clean, but with flabby granulations.

3rd February: 12 derm grafts, each 1 1/2 inch long by 1/2 inch wide, were placed on the granulated surface, about 1/2 inch from each other, and dressed as usual. The other derm grafts being full thickness.

4th grafts off & healing down - came away on the dressing.

7th: Three remain, but smaller than when applied, healing.

9th: Three white patches only, mark these three grafts. The lid's lather is not darkened. Grafts are invading healthy.

18th: Ulcer is now only 3/8 of an inch wide at the central part, but the nicks stain formed by the margins is considerably thickened at the site of the three grafts.

26th Result: Patient discharged quite cured.
Case XXVIII.

Derm Grafting.

Thomas Christo, aged 63, was admitted 23 June 1882, with a large ulcer on his right leg. Was a dragoone.

History: 7 years ago he had a kick on his right shin, causing a wound after longinquing. Was in account of it discharged from the army, when he lived a dissipated life. It has never been healed since. He had Sc. Erythema.

Present State: On his right leg about 2 inches above a malleolar line. The ulcer extends 4 inches laterally, and 2 1/2 inches across, over the fibula and tibia. The former had been thinly covered; the ulcer is considerably hollowed out, especially as between the lines. The edges are callous and abrupt. Thence, is not much discharge from the surface.

23 April 83; 18 grafts from Case III. And placed upon washed granulations on the upper half of the wound. The long axis of each graft was parallel to that of the leg. Blood clot formed adhering cragula. The grafts were 18 days removed from the cortex.

24th: Great discharge, not purulent. The epidermic parts of the grafts are gone, but elevations of granulations appear in their places.

28th: grafts not well marked. Erosion irrefragibly. Staat before the grafting—not much discharge.

7th: graft all gone—wound not decreasing because the patient walks daily a bit long too much.

Result: 18 grafts—16 days old—all sloughed.
Case XXIX. to XXXI  Derm. Sponge  &  Derm.

William King, aged 53.  Hamlet was admitted 3rd January 1893, with an ulcer on his left leg.

History  28 years ago, a pimpel came on the hinder part of his left leg.  It swelled it, and made it very sore.  In about 2 years, went up the leg 9 inches, or around, all but 1 inch.  It has never been quite healed.  It had cleared 32 years ago, then he led a quiet life.  Was a heavy drinker.

Present State.  About 2 inches above a malleolar line on the front of his left leg, an ulcer extends 3 inches forward, and 3 1/2 inches across.

22nd April - here is my patient, having a healthy skin, fluid promulgations, not a great discharge, with thin purple healing margins.  On the inner half I placed 13 grafts from Case III, in the usual manner, placing all with their long axes parallel, until three of the vessels of the limb, 5 grafts were close to, or touching the margins.  The patient was placed in bed.

24th  First discharge, very offensive, discolouring the whole with five very eddy.

29th  2nd day daily.  Grafts slightly raised as Whitfield effect.  A quantity of dried like material comes away daily.  Grafts healing.

1st May - Grafts done.

16th " Repair now stagnating.  Patient keeps in bed.
Case XXX.

Patient, William King, as last.

26th June - Several kinds of dressings have been used without much avail. Now the ulcer measures 2 3/8 inches from above rim and 2 3/4 inches across. The granulations are now unhealthy, flabby, pale, and seem to contain a great deal of fibrous tissue. Blood will difficulty be scratched. Two small ulcers are commencing at the sides of the larger. Sponge was placed over 1/3 of the entire surface, after severe scratching.

30th June - Stripped daily. A little sponge turning black was pouring. Must was full of blood clot.

4th July. The bar symptom. Several dark spots were observed. They contained pus and reddish exudate.

10th. All the margins turning into jelly like substance.

12th. Measurements now are 9/16 inch from above done and 2 inches across. The sponge almost shorn is quite firm. The subcutis are represented by this yellow transparent jelly like substance.

18th. All sponge has disappeared, leaving a red, fluid, healthy look, empyring very favorably with the wound condition present. The sponge was placed on.

Also repair has found a well gained.
Case XXXI

Derm Grafting.

11th again the subject as before.

10th August 1933 — Ulcer now expanding from above downwards, and 3/8 inches across. Granulations and very congested. They bleed freely when pressed.

1st graft was placed on the bleeding surface, particularly at the edges, and Saranar dressings applied with an elastic bandage.

14th — 4th graft now adhering. I send away in the dressings. The 4th have their upper surface split. The pigmented.

12th September — Returned from my holiday. I find the area 1/2 inch by 1/4, with thickened edges. T a fairly healthy surface. The eves skin has a squamous texture and scales frequently.

Ships of plaster now removed, lighted across the cor.

22nd Patient is not so well, looks weak and asthenic. A greenish fungus (would later) has attacked his arm, especially any epidermis lying around the wound, and the bandages especially. Shunt dressing ceased. Treatment — Charcoal powder.

Similar fungoid spots have attacked five other fingers in the hand. Microscopically, they appear like the Penicillium.

29th September — Result:

Discharged — Sore the size of a pinhead.
Case XXXII. Sponge Grafting.

Thomas Butler, 43, dock labourer, was admitted 29th April 1889, with an Ulcer on his Right leg.

History: 3 years ago he had his ringlets on the front of his right shin, which became ulcerated, and caused a wound. In 10 months it attained to its present size, owing chiefly to his neglect. He lived an irregular life - a hard and drinking usherer. A small cut, often having no food. Patient was both an old man, Jimmie Finanlly.

Present State: Leg ulcerated. The right about 1½ inches in length, 1⅛ inches across, 1⅛ inches above, and 1½ inches across. It is nearly round the leg, and is very dirty, and cotton looking.

26th June: how is clean healthy looking. But changes rather very well. Sponge graft, 3 i number, and placed on the scratched surface.

30th July: well, treated slightly in their straight parts. They bleed freely when scratched - but few in sensation.

6th July: How the next piece, it is necessary to press to free of retained pus, daily.

10th: nearly all well soon. In this place appear a few yellow spots, dotted with red (apparently enlarged capillaries). A little blood is extracted, no sensation, still no sensation.

13th: The Fuse of sponge - This wound tend to regular colour increase.

The wound itself is distinctly clean and fairly clean.
Case XXXIII.

Thomas Butler — again.

10th August — The ulcer has a healthy base, with thin, invading margins — base the core extends for 3 to 5 inches across, 4 inches from above downwards.

11th Two grafts from Casedihc placed in the cord, owing for the purulent granulations — dropping, scabbing.

12th No very satisfactory — one came away, two pain.

14th Healing rapidly — one graft partly enveloped in clot, which appears organizing and holding the graft securely.

Two grafts are on the ulcer surface. No unfavourable symptoms.

12th September — During my month's absence I am informed the three grafts all grew, how they are incorporated and new skin and the core nearly healed. Granulations healthy.

29th Healing is encouraged by placing in bed, keeping the feet-legs elevated about 1 inch, with blocks below the lower legs of the bed. 9 sheets of plaster applied by the core.

22nd October — Sore quite healed. I'll leave tomorrow.

Bridges of skin followed the plaster over the granulations and soon subdivided the ulcer.

Result — discharged well after the second grafting.
Case XXXIV.

MILLS - COT. aged 59, Housekeeper, was admitted 31st January 1833, with a large, indolent ulcer on the shin of his right leg, and very dirty. It had, very irregularly, been a regular cicatrix, an irregular ulcer, and had Syphilis.

History - 5 years ago he was kicked by a horse in the side, & neglected the injury. In 8 months got worse, its present size, viz. 6 1/2 inches around the leg, & 3 1/4 from above downwards.

Present state - here ulcer on the right leg in front, as above placed, commencing about 2 inches above a palpable line. It is irregularly triangular, surface bright crimson, and turgid, and pink, their edges are punched. Edge, healing - Surrounding skin syphilitic.

13th September, I placed on the scratched granulations the grafts, very thin grafts from Case IV. now 34 days removed from the coasts and kept in a jar of dipped wool at a temperature of about 98°F. The scum small, slightly a opening it. The granulations had partly, through the grafts were placed in considerable coagulum - the droppings were as usual.

15th. Nearly all the grafts are clustering well in the coagulum - its particular odour, and the leg comfortable.

17th. Dress daily. The grafts are refilling at their surfaces, but in well marked instances the exciting coagulum was infiltrated with small capillaries, and the adjacent-granulations were engorged. The old site was only darkening in three thin places about 1/4 in square.
24th. Draped daily – no unhealthy symptoms – In the same week a green fungus has appeared on the marginal epidermis of small areas, especially so indemned epidermis. The site of skin grafts has a congested look, i.e. granulations, capillaries are enlarged & tender, some may be seen with a small hand glass. One of these fungus patches a thin film appears - the ulcer is healing from the margin.

11th. Uterus now 2 cm long, by 1 cm across at its widest.

11th. Patches of plastic were placed across the ulcers and around the leg.

11th. Reduced to 1/16 in by 1/2, inch: Toping has [[[insert]]:]

20th. Plastic causes improvement: Toping has Panthenol lotion.

11th her Dr. Bergin to apply oil to make a soothing, astringent as an irritant it caused a reddening breaking down of the skin.

2nd Jan. All grafts disappeared.

14th April - Ulcer quite healed.

Result - Healed considerably after skin grafting - afterwards both done again - discharged well.
Case XXXV.

T. Grafting.

James Alliston, aged 35, Rochdale, was admitted 21st September 83
with a large ulcer on his left shin. It was very callous. Edge thick.

History - It was caused by a rush two years previously, which
neglected, got very large. Has been healed. Has a varicose leg.
The internal lymphatics were below the knees, little on the thigh. It
haunts constantly, but a unhappy drinker. Absolutely profligate. Somatic,
plethora, gland round. Is fairly well nourished now. Has had Sydney.

Present State. Over the front of the lower third of his left leg
an ulcer extends circularly across, t from circle to circle from above
downwards. Granulations stable, suppurating, bleeding easily, plus scabs.
Discharge fair. Margins healthy and invading.

Treatment. 30th October 83 - 20 centimetre long placed on the
scratched granulations from Case V; 8 hours after death. The
Cadaver was 2 years old) stripping Corticis 00, Cauterizing.

5th. First discharge requiring daily stripping. Slight top watering
down - A little confluence appears in various sites; otherwise the granulation
are suppurating.

7th. He uncomfortable symptom. First purulent discharge - Ulcer is
healing rapidly. The graft is growing very well.

29th. Ulcer very small, graft has blended with the marginal skin.

17th. Another graft has appeared and is proving vigorously.

It is quite circular in the granulations. The bottom of the hole has
been cleared by Imber 10 inches high. Has marginal frost over depuration.

11th. Second graft gone well. Another bandages are supplemented.

6th. The two bridges of skin have grown across the ulcer, subdividing
it into three small ones, each section is healing satisfactorily.
20th December 1882. Improvement continues. Each bridge of new lines is widening and one over its sides of previous frays.

27th The pond, from an unexplained cause, has broken out again, now it is 3½ inches across by 1½ from above dam and. It may be due to resumed Otman activities. He feels would was fore-sighting.

Result: New frays - not from very self.
Thomas Richards, aged 61, was admitted 15th Oct. 1823 with a large ulcer on his left leg, and profusely.

History: 3 years ago he was struck by a policeman's staff on his left shin, this caused a wound, and ulcerated; it assumed its present shape. Has never been cured. Died after residence at King's Hospital.
The ulcer reduced in size of a chilliing. Habit of drinking

Present State: Temp. 92° just above a malleolar line on the inner side of the left leg. The ulcer extends 3 inches. It is soft, having its greatest breadth 2 inches. It is principally over the lower part of the leg. Callus thick. Fumigation clean and not exciting smell. It is seemingly hollowed from loss of substance. Surrounding skin normal.

Treatment: Sponge proper was placed over about 1/2 the surface after parcelling. Dressing, Carbolic oil, old pith, Balsam four days.

29th 3rd November: Drapery daily - Sponge is being transformed rapidly, the bad symptoms have ceased. Offers no distressing smell.

16th November. Sponge has been placed at the bottom of the patient's bedstead.

19th November. The ulceration of the legs has caused a quicker penetration of the sponge by fumigation, the absorption. Thus the sponge was 1/6 of an inch thick, it now appears quite jelly-like; place thicker, the upper surface remains as sponge holding pus. Irrigation best-eruvens thin pus. The graft frequently bleed during their dressing.

Any little sponge remains can now be seen, only in the thickest places. Margin invading cause traction in surrounding painful parts, which causes pain.
20th June: No enemas

11th Dec: He has been up and about. Slight sense of fullness, also the few flaccid stools, having apparently low vitality.

13th Discharged, with all spores having vanished. Urine negative.

Result as 13th December.
Michael Jommar, aged 38, shot Laborer, was admitted 25th October 1983, with an ulcer on his left leg.

History. Few years ago from an injury to his India he struck his left shin against the engine step causing an abrasion. Neglected, it produced a sloughing wound which, more or less, has riddled him ever since. Living was precarious.

Present Condition. A serpigenous ulcer shape over the left shin, commencing 6 inches above a medullary line, 7 inches from above down, and 13/8 inches across at its widest. Sinus free, clean, moist healing.

30th Oct. 4 small pieces, divided from one piece taken from over the left hip, were placed in the granulations and previously punctured. Each graft was about 1/8 in by 5/16 in. Dr. person view Carbolic.

1st Nov. The grafts are, some have shifted, but few adhering.

9th. Dr. person second day only. 4 grafts appear as intubated elevations, firmly in their places, but having the serpensive fibroplasia.

12th. Independent grafts have commenced on third day to which 4 of the initial shin is invading the granulations, and has united with the margin.

20th. Patient states his leg has never healed so rapidly, grafts proving.

26th. The wound has healed excepting 4 hliets refered where the new skin, shin has gone gray. Patient sits up.

Result. Discharged cured 30th December 1983. Residuance

Thence was 3 WEEKS and 14 days.
Case XXXVIII.

Skin Grafting.

Catherine Harrington, aged 36, single, was admitted 22nd October 1883, with a large ulcer on each leg.

History. 8 years ago she was kicked on her left shin, and the laceration produced healed only three years afterwards. A stump formed 14 months afterwards, which scratched, formed a sore, and has not properly healed.

Habits. Predisposed to hiccough, consequently she has very little food sometimes. For two days before admission she had nothing to eat. She had three illegitimate children.

Present state. When seen, there was a ulcer on each leg, (left) commencing 1½ inches above the malleolar line, pear-shaped and measures 2½ inches at its widest. Its sides is over the fibula rotated to that bone. The varicosity is discernible.

Treatment. 3 sections of a piece taken from her left arm were placed in the punctured pannus. Their long axes were as far as possible, parallel to that of the leg. On 19th November 1883.

26th Dec. The grafts are firmly in the organizing stage, which have the appearance of buds with pinkish hues on the score.

11th December. The grafts were almost covered, but have limited. The future perforation has produced cysts which were discarded. Each graft has a thick, elevated center (the original deposit) with an external zone of pale cream color.

23rd December. The discharge herself, the wound was nearly healed.

Result. 15 grafts in each, 10 into very well, causing a rapid cure of the sore.
Case XXXIX.

Emily Head, aged 25, (see Case XIX), was again admitted for the extensive burn of her right arm, on 18th August 1893.

Present State. The previous cicatrices induced by Spongel grafting below very well. Now she has a core 1/8 inches long, by 1/8 inches across, on the inner surface of her right arm, 1/2 inches below the outer. The surrounding skin being all cicatrising, there is now a firm way by traction.

Treatment — 1st December 1893 — I removed skin from her left little finger by 1/4 inch, and at once placed it on the pumellations, without their being scarified. Dressings as usual.

5th Dec. Draped very sound day — It adheres well, and has a faint line of attachment. No much discharge.

11th All is now a purple line elevation, bleeds when pressed, has a very slight marginal shrunk.

24th December — hour the graft nearly covers the united sore, the sloughing of the epidermis has been considerably.

20th December — It is healed.

Result — the graft placed on a sore near my cell.
David McLaughlin, aged 47, fishmonger, was admitted 15th Dec 1883 with a large dry ulcer on his left leg.

History. 6 years ago he had a small sore about one inch above the ankle, this scratched, spread to its present size. It has quite healed under treatment. Habits irregular, poor supply of food.

Has had lymphs.

Present State. On his left leg 3 inches above a malleolar line, in front and laterally, his ulcer extends 2% inches from above downward and 4½ inches across.

23rd December. The sore being fairly clean, discharging slightly, and with small granulations; 10 small pieces from his arm now placed dry on it. Sanitsés [sic] dressings.

1st Jan. Two smallest grafts have died, 4 turned the corner, and one large central one remain. Their upper surfaces have changed, deep surfaces richly permeated with capillaries.

20th. The 4 marginal grafts have incorporated with the margins.

Central one is about as large as a three penny piece.

23rd. The central graft is about as large as a penny piece.

28th. Three new grafts taken from his right arm now placed around the existing graft without any scratching. Each was 1½ inch long by ½ inch wide.

4th February. There has been great persistent discharge, not only from graft-paturns, it is about as large as a three penny piece.

Case XIII.

Derm Grafting.

Alfred Vaughan, aged 42, Single, Bookbinder, was admitted 1st December 1884, with a large sloughing, slitting ulcer on his right leg.

History — 12 years ago he struck his right shin with a key of butter; the sore formed, increased, and 12 months after violent haemorrhage followed; it was cured at the London Hospital. It has been a sore off and on ever since. It is now 11 years since it quite healed. He has been a hard drinker occasionally. Never long deprived of food.

Examination — He is of full habit.

Present State — I inch above a small line on his right leg the ulcer extends upwards for 5 inches. It extends round the leg approaching a bridge of about 2 inches.

Treatment — 29th January 1885 — 12 small grafts from Case VI. now placed on the uncovered granulations. Epsom salts and carbolic oil & baume 1/2 as usual.

1st February. Improved daily. Grafts have their upper surfaces sloughing, and appear to have moved.

11th. The grafts are proving well. It have united with the margin.

14th. They have formed a line of new tissue 1/2 inch long, almost parallel with the lower edge of the ulcer, but bearing a granulating surface 1/2 inch dividing. To day was photographed as over.

24th. The grafts have united better with the margin, and others have gone across the ulcer as bridges of skin; the new are 44 staples.

10th March. The bridges of skin are widening slowly, the widest is now 1/4 inch wide.
Case XLIII.

Skin Grafting after Derm Grafting.

Alfred Vaughan, the previous patient.

After the early part of March repair of the ulcer seemed to lag, the granulations became large and flabby, and had to be reduced by Caustics.

31st March. A more healthy surface following the caustics. Of the remaining large parts, 2 inches by 1\(\frac{1}{2}\) inches; 6 small grafts taken from over the lip; keeps the ointment on the granulated granulations. bandages and paint with lotion of gauze.

2nd April. All out, grafts are satisfactory, not wrong.

7th. Discharge great, the epidermis appears quite normal, and the grafts are still present, but they all appear as red tubes on the skin.

9th. Now assuming normal "de novo".

16th. Four grafts do very well, two marginal, have incorporated with the marginal skin. Two central are forming actively. They are noticeable as the improved general repair since the grafting.

22nd. Improvement continues. The four grafts now nearly cover the wound except at its upper part. They have united considerably with one another, and with the margins.
Timothy Collins, S.S., admitted 6th November 1883.

Ulex 14 in. x 11 in.

Grafted with Derm. 29th January 1884.
Case XLIV.

Timothy Collins, 53. Single. A book-keeper, was admitted 6th December 1893 with ulceration of his right leg.

History. 10 years ago a pimple appeared just below the outer small muscle of his right leg. Scratching this made an ulcer, which has 3 or 4 times healed, but it has been a year six months.

Present State. He is a peculiar fellow, having many attributes of an hermaphroditus—i.e. small genital organs, little hair on the inner thighs, very enlarged mammae. He has a his voice, shrill, feminine-like—very prominent abdomen. He states "He is no man, no woman," and has never had appetites.

Habits peculiar—frequents joss-writer—plum.

With a pimple of about 2 inches from the outer small muscle on his right leg, on which appears, daily, and callous.

Treatment. 29th January 1894. The sore being cleansed and healthy, and melted elevating the lower legs of his bed. 6 grafts of skin from Case VI. were placed on his granulations not scratched.

4th February. Draped daily, grafts growing well. Around the margin, they are permeated with capillaries which produce a pink zone; these begin one that is soft, soft, and breaking down.

11th. Some grafts have merged with the margin. Two others in the pore have doubled their size. They appear as opaque islands of a pale pink hue, with a margin of a deeper pink, due doubtless to the capillaries.

12th. Am-photographed. These two islands from very tall.

1st March. Result. Completeness healed. The new skin is purple & the edge of the graft show as white specks. It is thickish.
Case XLV.

Derm Grafting.

E. A. Wilson, 43. A hunter, was admitted 22nd January 1894, with a large ulcer on his right leg. It was very dirty.

History. It was caused 6 years ago by a rabbit, followed by being pounced by a step of a cart, produced a very large sore. It has never been treated. Has had syphilis, is of very uncertain habits.

Present State. The ulcer is now nearly round the leg, 1½ inches deep, commencing 1 inch above a knuckle bone. Formulations large, discharging considerably.

Treatment. 11 grafts (2 days removed from the leg and kept in water), which turned the black outside, were placed on the two scratched formulations. The black was pared away as much as possible. 1st February 1894.

1st daily dressings. All grafts are rapidly sloughing away. There is very great discharge. Patient has no bad symptoms.

11th. Very little of the grafts remains. The ulcer is healing from its margins.

1st March. The traces of grafts remain. The leg is elevated by bandage, & marginal healing proceeds.

11th March. His discharge of himself very greatly better.

Result. 11 grafts - all sloughing.
Case I. 26th August 1892—Jno. Brown, aged 46, died of apoplexy, after an attack of 10 hours duration. 6 hours after death, when the body temperature was about 81° F. I removed a strip of skin down to the subcutaneous tissue from the middle line of the abdomen. It was cut into pieces about 1/4 inch square, and placed in Solution of Carboxyl and Carbolic Acid of each 1 part Water 20 parts. It was applied in Cases 16, and 21.

Case II. 13th November 1892—M. Jonathan Hutchinson, Senior Surgeon to the London Hospital, amputated below the knee for Ahmens disease of the knee. Within half an hour after the removal I took strips of skin from the thigh, similar to the above, and placed in 1 to 20 Carbolic and Strychnine Solution. The strips at once withered up, and about an hour after they had a hard necrotic feel. The boy was 9 years old. It was applied in Cases 22, 23, and 24.
Case III.

14 April 1883. Stain was taken from a fetus aged 1½ hours, within one hour after its death. It was taken from 1 inch to the right of the spine. No subcutaneous fascia or fat was obtained. It was placed in 16720 Lauer's 6A Solution. It was a soft, smooth, jelly, and its parents being sick, caused a little diarrhoea at my pressing the stain. It was placed in:

Cases 25, 26, and 27.

Case IV.

11th August 1883 — Removed stain from the front of the left thigh of Caroline Hensop, aged 12½, who died of apoplexy yesterday. 13 hours had elapsed. The body was warm. The stain deprived of subcutaneous fascia and fat was placed in a serum of sheep's blood to which Acid Carbolic Acid was added. It was placed in a chamber, remaining about a temperature of 90° F and used in:

Cases 31, 33, and 34.
Case V.

3rd October 1883. Stain 1 1/2 inches by 1/4 inch was taken from the thigh of Marion Fannie Berry, aged 2 years, six hours after death, while the body was warm. Meningitis was the cause of death. The stain was placed in the Serum of Sheep's Blood obtained 1st August, to which 0.5 Cc. Tubercolin 1 drops per ounce were added. Though two months old, no bacteria could be detected. It was placed in Case 35.

Case VI.

29th January 1884. A primrose leg was amputated at the London Hospital; stain was at once taken from the limb, placed in health and applied the same day to Cases 142, 144, and 145 2 days afterwards.
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<tr>
<td>Elizabeth Y.</td>
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<td>1/2</td>
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</tr>
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<tr>
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<td>64</td>
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<tr>
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<tr>
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<td>53</td>
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<tr>
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<td>43</td>
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<td>Case</td>
<td>Dressing</td>
<td>Previous Duration</td>
<td>When Healed</td>
<td>Remarks</td>
<td></td>
</tr>
<tr>
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<td>------------------</td>
<td>-------------</td>
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<td>6</td>
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<td>Not stated</td>
<td>Not stated</td>
<td>5 years</td>
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</tr>
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<td>8</td>
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<td>Not stated</td>
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<td>12</td>
<td>D?</td>
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<td>Not stated</td>
<td>15 days</td>
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<td>7 months</td>
<td>22 days</td>
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<td>44</td>
<td>D?</td>
<td>7 years</td>
<td>62 days</td>
<td></td>
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<tr>
<td>14</td>
<td>D?</td>
<td>7 years</td>
<td>33 days</td>
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<td>D?</td>
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<td>D?</td>
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<td>D?</td>
<td>7 years</td>
<td>141 days</td>
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<table>
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<th>Dressing</th>
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<th>When Healed</th>
<th>Remarks</th>
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<tr>
<td>12</td>
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<td>3 years</td>
<td>49</td>
<td>all organised, most active.</td>
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<td>64</td>
<td>D?</td>
<td>7 years</td>
<td>69</td>
<td>just past slight.</td>
</tr>
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<td>18</td>
<td>D?</td>
<td>7 years</td>
<td>110 days</td>
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<td>4</td>
<td>D?</td>
<td>7 years</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>D?</td>
<td>7 years</td>
<td>not healed</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>D?</td>
<td>7 years</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>D?</td>
<td>7 years</td>
<td>21</td>
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<table>
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<th>Dressing</th>
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<th>When Healed</th>
<th>Remarks</th>
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<tr>
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<td>Carbolic acid</td>
<td>3 years</td>
<td>49</td>
<td>all organised, most active.</td>
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<tr>
<td>64</td>
<td>D?</td>
<td>7 years</td>
<td>69</td>
<td>just past slight.</td>
</tr>
<tr>
<td>18</td>
<td>D?</td>
<td>7 years</td>
<td>110 days</td>
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<tr>
<td>4</td>
<td>D?</td>
<td>7 years</td>
<td>23</td>
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<tr>
<td>7</td>
<td>D?</td>
<td>7 years</td>
<td>not healed</td>
<td></td>
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<tr>
<td>3</td>
<td>D?</td>
<td>7 years</td>
<td>20</td>
<td></td>
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<tr>
<td>13</td>
<td>D?</td>
<td>7 years</td>
<td>21</td>
<td></td>
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</table>

Front page, Carried 3 years, 49 | all organised, most active.
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Age</th>
<th>Size</th>
<th>Site</th>
<th>Graft</th>
<th>No. of trees</th>
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<tbody>
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<td>31</td>
<td>William K.</td>
<td>55</td>
<td>¾ x 1/2</td>
<td>2½ in H.M.</td>
<td>2½ in H.M.</td>
<td>1</td>
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<tr>
<td>32</td>
<td>Thomas H.</td>
<td>43</td>
<td>6 x 1/2</td>
<td>5 in H.M.</td>
<td>5 in H.M.</td>
<td>1</td>
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<tr>
<td>33</td>
<td></td>
<td>143 (same)</td>
<td>4½ x 7/8</td>
<td>10 in H.M.</td>
<td>10 in H.M.</td>
<td>11</td>
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<tr>
<td>34</td>
<td>William C.</td>
<td>50</td>
<td>3½ x 2</td>
<td>1½ in H.M.</td>
<td>1½ in H.M.</td>
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</tr>
<tr>
<td>35</td>
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<td>2½ in H.M.</td>
<td>20</td>
</tr>
<tr>
<td>36</td>
<td>Thomas C.</td>
<td>60</td>
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<td>3½ in H.M.</td>
<td>½ cord</td>
</tr>
<tr>
<td>37</td>
<td>Michael S.</td>
<td>38</td>
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<td>4½ in H.M.</td>
<td>4½ in H.M.</td>
<td>9</td>
</tr>
<tr>
<td>38</td>
<td>Catharine H.</td>
<td>60</td>
<td>6 x 2½</td>
<td>6 in H.M.</td>
<td>6 in H.M.</td>
<td>15</td>
</tr>
<tr>
<td>39</td>
<td>Emily H.</td>
<td>16 h 14</td>
<td>1½ x ½</td>
<td>2½ in H.M.</td>
<td>2½ in H.M.</td>
<td>1 larv</td>
</tr>
<tr>
<td>40</td>
<td>Jacob M.</td>
<td>14</td>
<td>2½ x 1½</td>
<td>2½ in H.M.</td>
<td>2½ in H.M.</td>
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<tr>
<td>41</td>
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<td>2½ in H.M.</td>
<td>2½ in H.M.</td>
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<tr>
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<td>Alfred V</td>
<td>42</td>
<td>2½ x 2½</td>
<td>5 in H.M.</td>
<td>5 in H.M.</td>
<td>14</td>
</tr>
<tr>
<td>43</td>
<td></td>
<td>42 (same)</td>
<td>2 x 1½</td>
<td>5 in H.M.</td>
<td>5 in H.M.</td>
<td>6</td>
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<tr>
<td>44</td>
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<td>53</td>
<td>2 x 2</td>
<td>1½ in H.M.</td>
<td>1½ in H.M.</td>
<td>6</td>
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<tr>
<td>45</td>
<td>George D.</td>
<td>45</td>
<td>6 x 1½</td>
<td>1½ in H.M.</td>
<td>1½ in H.M.</td>
<td>14</td>
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</tbody>
</table>
Summarised Result

Derm. 4+ pns, ulcer under hi site.
Sponge. All transformed producing great re-epithelisation.
Derm. pns very well.
Derm. 34 days removed from body, have pns.
Derm. 2 pns well, wound afterwards broke down.
Sponge procted, all transformed and no bad symptom.
No clot, some grafts detached, independent growth the 13th day.
Clot - Grafts pns well - Gutta Percha produced erythema.
No clot. Small wound with little discharge. Little sloughing of epidermis. Area.
4 grafts were incorporated with the margin, and one center island.
Same patient. No clot. Greatly well - Local treatment
Very troublesome wound, profoundly infected by Derm grafting.
4 grafts grew well - Great improvement of the area. Nearly well. Local treatment.
Derm. Healed very well indeed.
Derm. Placed in contact with transplanted site and all lensed.
<table>
<thead>
<tr>
<th>Name</th>
<th>Occupation</th>
<th>Cause of Death</th>
<th>Blood clot</th>
</tr>
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<tbody>
<tr>
<td>1.</td>
<td>Joseph T</td>
<td>Bookbinder</td>
<td>?</td>
</tr>
<tr>
<td>2.</td>
<td>Elijah J</td>
<td>Teamster</td>
<td>?</td>
</tr>
<tr>
<td>3.</td>
<td>&quot; (second line)&quot;</td>
<td></td>
<td>?</td>
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<tr>
<td>5.</td>
<td>Robert J</td>
<td>Starchaker</td>
<td>Bite of cat</td>
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<tr>
<td>6.</td>
<td>Jeremiah J</td>
<td>Bookbinder</td>
<td>Leg wound</td>
</tr>
<tr>
<td>7.</td>
<td>Anna M</td>
<td>Seamstress</td>
<td>Nose bite</td>
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<td>8.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>John C</td>
<td>Blind Beggar</td>
<td>?</td>
</tr>
<tr>
<td>10.</td>
<td>M. S</td>
<td>General Patient</td>
<td>Burn</td>
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<tr>
<td>11.</td>
<td>Julius B</td>
<td>Hatter</td>
<td>Kick</td>
</tr>
<tr>
<td>12.</td>
<td>William C</td>
<td>Cutter</td>
<td>Struck by a horse</td>
</tr>
<tr>
<td>13.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Emily H</td>
<td>Ped.</td>
<td>Burn</td>
</tr>
<tr>
<td>15.</td>
<td>Joseph M</td>
<td>House and</td>
<td>Kick by a horse</td>
</tr>
<tr>
<td>16.</td>
<td></td>
<td>Soldier</td>
<td></td>
</tr>
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<td>17.</td>
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<td></td>
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<td>18.</td>
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<td></td>
<td></td>
</tr>
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<td>Ellen C</td>
<td>Clerkman</td>
<td>Scratching to skin</td>
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<td>John C</td>
<td>Blind Beggar</td>
<td>?</td>
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<td>John G</td>
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<td>Burn</td>
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<td>George H</td>
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<td>Burn</td>
</tr>
<tr>
<td>23.</td>
<td>Mary D</td>
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<td>Appendicitis</td>
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<td>27.</td>
<td>Thomas B</td>
<td>Clerk</td>
<td>Tooth</td>
</tr>
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<td>28.</td>
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<td>Hatter</td>
<td>Pimple injured</td>
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<tr>
<td>30.</td>
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</tbody>
</table>
Summarised Results.


Note, three when he returned to work, the cent to disappear last.

Note then, two days after a 14th bandage was applied.

Healed after 14-year treatment.

Dressed cured in three months after.


Satisfactory

Sponge removed. He perspired. A film formed the second of sponge.

Sweat glands of neck's at the time of the same. No sponge present.

Sponge removed an inch later. Perspiration followed. Most sponge removed.


Sponge present, no signs of inflammation followed.

Small pustules will nearly magical disappear, not mix stain, all stopped.

Derm. 10 grafts from a patient, all quickly started away.

Sponge. All organisms in 28 days, no bad symptoms.

Derm. First these organisms could not.

Derm. Film followed out beneath cured.

Derm. Film produced and mixed healthy granulations.

Sponge. Yet organisms without a bad symptom.

Derm. Grew well, bleeding after.

Sponge. Organised in 30 days, well matured.

Derm. I grew fairly.

Derm. All stopped, in 14 days, no bad symptom.

Derm. 5 & 7. Repairs in activity proceeded.

Sponge. All transportable, with any bad symptom.
<table>
<thead>
<tr>
<th>Name</th>
<th>Occupation</th>
<th>Site of Illness</th>
<th>1st Blood clot</th>
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<tbody>
<tr>
<td>31. William W.</td>
<td>Hawker</td>
<td>Purple liquid</td>
<td>Yes</td>
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<td>32. Thomas B.</td>
<td>Dock Labourer</td>
<td>&quot;</td>
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<tr>
<td>33.</td>
<td>&quot;</td>
<td>&quot;</td>
<td>Yes</td>
</tr>
<tr>
<td>34. William C.</td>
<td>Horsekeeper</td>
<td>Kicks by Horse</td>
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<tr>
<td>35. James C.</td>
<td>Policeman</td>
<td>Kick</td>
<td>Yes</td>
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<td>36. Thomas K.</td>
<td>Hawker</td>
<td>Struck by Policeman’s bat.</td>
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<tr>
<td>37. Michael G.</td>
<td>Dock Labourer</td>
<td>Struck step of Engine</td>
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</tr>
<tr>
<td>38. Catherine H.</td>
<td>&quot;</td>
<td>&quot;</td>
<td>Yes</td>
</tr>
<tr>
<td>39. Emily H.</td>
<td>&quot;</td>
<td>&quot;</td>
<td>No</td>
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<tr>
<td>40. David Reid</td>
<td>Fishmonger</td>
<td>Sore scratched</td>
<td>No</td>
</tr>
<tr>
<td>41.</td>
<td>&quot;</td>
<td>&quot;</td>
<td>No</td>
</tr>
<tr>
<td>42. Alfred V.</td>
<td>Dock Labourer</td>
<td>Struck by tug of batter</td>
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</tr>
<tr>
<td>43.</td>
<td>&quot;</td>
<td>&quot;</td>
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</tr>
<tr>
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<td>&quot;</td>
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</tr>
<tr>
<td>45. George M.</td>
<td>Hawker</td>
<td>Kick</td>
<td>No</td>
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