Notes on the treatment of burns and scalds and the deformities they occasion : with two cases of plastic operation under the care of the author / by Francis Mason.

H. Flower Esq with the author's kind regards

NOTES

ON THE

ATMENT OF BURNS AND SCALDS

AND

DEFORMITIES THEY OCCASION.

WITH

ASES OF PLASTIC OPERATION UNDER THE CARE OF THE AUTHOR.

BY

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NOTES

ON THE

TREATMENT OF BURNS AND SCALDS

AND THE DEFORMITIES THEY OCCASION;

WITH

TWO CASES OF PLASTIC OPERATION UNDER THE CARE OF THE AUTHOR.

The following communication is intended to be a supplementary paper to that on "The Treatment of Cicatrices after Burns" I contributed to the 'St. Thomas's Hospital Reports' for 1872. In that volume I gave the particulars of cases on which I had operated for the relief of deformity, and now take the opportunity of referring to two additional examples which have recently been under by observation at the hospital.

Before, however, entering on the details of these cases, I wish to direct attention to the different and singularly opposite methods of treatment of burns and scalds themselves, which have been recommended from time to time, and which I have taken at some pains to collect. The subject of treatment is very important when we consider the intense agony that such injuries occasion and the high rate of mortality that accompanies them. I also purpose referring briefly to some of the results of burns and scalds, together with the diseases to which

cicatrices are liable, and, in conclusion, shall review some of the modes of treating the contractions consequent on these injuries.

At my request the Registrar-General has courteously furnished me with the subjoined table, including "particulars showing the number of deaths registered from burns and scalds in England and Wales for the ten years 1863—1872," from which it appears that the average mortality from such injuries is about 2600 annually :

Deaths registered in England and Wales.

(Accident or Negligence.)	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872
1. Fractures and Contusions	5852	6500	6843	6661	6596	6508	6303	6447	6837	6974
2. Gunshot Wounds	108	126	112	131	124	118	105	130	102	74
3. Cut, Stab	82	115	93	97	103	103	125	95	111	118
4. *Burns and Scalds*	2766	2987	2713	2533	2600	2553	2545	2578	2612	2204
5. Poison	277	274	273	278	281	279	255	234	261	274
6. Drowning	2488	2714	2823	2786	2676	2924	2696	2504	2605	3010
7. Suffocation	1147	1245	1309	1263	1352	1192	1335	1419	1504	1568
8. Otherwise	1052	1130	1066	1137	1116	1038	896	986	929	940

The *treatment* of burns and scalds has been a vexed question, especially as to whether the applications should be employed hot or cold, or whether they should be stimulating or soothing. In the present day the popular plan, as the reader will presently see, is to use the well-known carron oil, and until four years ago it was my practice to employ this remedy; but long since I had doubts as to its efficacy, inasmuch as I observed in numerous instances that its application was attended with severe pain. Since my connection with St. Thomas's Hospital I have had the opportunity of testing the plan of treatment that has been largely used at that institution for about twelve years—that is, a mixture of whiting and vinegar ;[1] and, notwithstanding the evidence in favour of carron oil, I place greater faith in the former remedy.

It is necessarily difficult to ascertain the statistics of death

[1] The formula will be found at page 12, and is applicable to burns of the first, second, and third degree, not involving or only slightly involving the subcutaneous areolar tissue—such cases, indeed, as would be generally considered amenable to treatment.

after any given mode of treatment, but I am convinced that the mixture of whiting and vinegar affords a more speedy relief from pain than carron oil, nitrate of silver, or Kentish's plan with turpentine, &c.

It seems to be generally admitted that the fundamental principle in dealing with injuries of this nature is completely to exclude the atmospheric air, but there is considerable difference of opinion as to how this should be effected. "Cold," observes a writer, "has one great advantage, it can be adopted without delay. Many a cook who has scalded her arms or legs with hot water has at once found relief in a stream of cold water from the pump, and the popular remedies of cold scraped potatoes, cold soap-suds, brown paper steeped in cold vinegar and water, or cold spirit and water, are daily used with excellent effect."[1]

The white of egg is also useful, but we have a choice of remedies. Some surgeons have advocated *extreme* cold; thus, Mr. John Booker, of Cronstadt, writing more than thirty years ago, states that, "for the last twenty-four years, my treatment of burns and scalds has been the immediate application of pounded ice or snow."[2]

M. Jobert also has treated several cases of burns by the constant applications of bladders of ice. The results of this treatment are stated to be most satisfactory, for not only is the sphacelation (the chief source of the subsequent disfigurement) greatly limited by the action of cold, but the suppuration is rendered less abundant, and the cicatrices have been thin and destitute of the unsightly bridles, causing concentric retraction. The ice-bags are applied over the burnt surfaces and maintained night and day for many weeks, no other dressing, unless simple cerate, being used. The relief to suffering which is thus afforded is stated to be almost complete; when the burn is very extensive the prolonged cold bath is superadded. Another advantage which is stated to accrue from the practice is the prevention of the secondary visceral inflammations which are so frequently the cause of death in severe burns. Burns of the face and trunk have been cured with a promptitude and simplicity which is surprising, and have left but trifling cicatrices.[3]

[1] 'Cooper's Surg. Dict.,' art. "Burns," p. 357.

[2] 'Lancet,' 1840-41, vol. i, p. 103.

[3] 'Annales de Thérapeutique,' Janvier, 1846.

Mr. Earle was accustomed in burns of a minor description to apply cold water by keeping the parts continually covered with cloths saturated with the pure element, but Mr. Barrow, referring to this treatment,[1] remarks, "I had an opportunity of witnessing a tolerably extensive trial of this remedy at St. Bartholomew's Hospital, but I cannot speak of it as possessing any decided efficacious properties. There was a certain amount of comfort experienced for a time, but for a very limited extent, and I think the subsequent inflammation and sloughing were greatly increased." And with respect to the use of cold, Mr. Travers, writing in 1825, says, "Whatever may be the value of this mixture of carron oil as a topical application to burns, it certainly does not seem consistent to apply this or any other cold application during what may be considered the cold stage. It stands thus:—Brandy given to increase the circulation and consequent power of life; cold externally applied which diminishes both.[2] Mr. Barrow and Mr. Travers were both in favour of Kentish's plan.[3]

Various modifications of this plan have been employed; for example, at the Manchester Royal Infirmary in 1848, Mr. Robert Thorpe always had in readiness tow dipped in Linimentum Terebinthinæ, which was immediately applied.[4]

Then, on the other hand, we have from Vienna the so-called "hot-water cure." Professor Hebra had a bath constructed six feet long by three feet broad; it was made of wood and lined with zinc. Exactly fitting its interior was an iron framework which supported the ordinary undergirths of a bed. At about two feet from one end of this frame was attached a back support which moved on a hinge, and by means of a simple piece of rack-work could be fixed like a music-desk at any slope the patient found most comfortable, the whole bed covered with a blanket and reposing in a horsehair bolster, being suspended

[1] 'Prov. Med. and Surg. Journal,' 1848, p. 211.

[2] 'Lancet,' Aug. 13, 1825, p. 187.

[3] Kentish's plan, as the reader is no doubt aware, consisted in first bathing the burnt parts with tepid turpentine and then applying on linen a preparation of turpentine and wax (Ung. Resinæ, ℥j; Ol. Terebinthinæ, ℥ss), and placing it cold over every portion of the burnt surface, being careful to exclude *all* air. The dressings were removed every third or fourth day.—'Prov. Med. Journal,' 1848, p. 210.

[4] Ibid., p. 102.

n the bath by bands attached to both its extremities. Two mall rollers with handles attached were carried by the bath ase at the head and foot and received these bands, and thus nabled the bed to be raised or lowered at pleasure.

At the head of the bath, and standing higher than it, was a mall copper boiler which supplied the water at whatever temerature was required. The supply pipe entered at the bottom, he escape pipe left it at the water level. When in use the tream was kept constantly running, and thus all impurities ere rapidly washed away.

A good illustration of this method of treatment was found n the case of a woman who was admitted, having been extenively burnt all over her body from her clothes having caught re. The accident happened on May 19th, 1861, she having een admitted on May 27th. The calves of both legs posteiorly presented wounds eight inches in length by about five nches in breadth; upon the sides and posterior surfaces of oth thighs were burns more or less scattered about. She complained of intense pain, and shrieked out whenever her ounds were touched. Pulse 120. She was put at once into he bath bed. The water was raised to what temperature she sked for; this was 99° F., and kept at this warmth. She ad been scarcely an hour in the water when she could stretch er legs out, and said she had not a trace of pain in her sores. he most striking phenomena took place in the course of the irst forty-eight hours; the patient's pulse fell from 120 to 80, hile appetite replaced the previous thirst. She suffered no nore pain; even the touching her wounds under water hurt her ery little, although out of water this gave her the acutest orture. She was so comfortable that we had no grounds for aking her out of the water, in which she remained for twenty-ne days and nights. By degrees, to suit her comfort, the ater came to be lowered to 88° F. On June 18th the patient as taken out of the bath and she could go about without ain.[1]

Of other remedies we find that M. Lisfranc recommended a olution of chloride of sodium.[2] Mr. Rhind used a mixture of

[1] 'Med. Times and Gaz.,' Dec. 14, 1861.

[2] 'Lancet,' 1842-43, vol. ii, p. 628.

gum arabic,[1] and Dr. Samuel B. Fish, of Massachusetts, treated burns with thick mucilage of gum acacia over the recent wound and then dusted this well with the dry powder.[2] Another plan was to apply white lead over which lycopodium was dusted.[3] Mr. Peppercorn used lint dipped in a saturated solution of carbonate of soda.[4] Dr. Steward, of Queen's College, Birmingham, advocated the use of creasote; it was brushed over the wound once a day.[5]

The compound tincture of benzoin has been recommended,[6] and an ointment containing hydrocyanic acid (Scheele's), the formula being—simple cerate ʒij, and as much as it will take up of hydrocyanic acid applied on lint.[7]

In 1849 M. Valetta used collodion in burns very extensively;[8] and in 1858 Dr. A. Meadows introduced a mixture of collodion and castor oil (two parts of collodion to one of the oil).[9]

M. Chassaignac approved of what was termed the "occlusive dressing of burns." The dressing is applied like Baynton's strapping. Several straps are applied one over the other so as to form a shield, and then the whole is covered by lint and changed every eight or ten days.[10]

Dr. Ritterhouse recommended an ointment composed of one part of powdered rhubarb to two of lard.[11]

Again, dry preparations have been greatly extolled. Mr. Pope advocated the application of a mixture of flour and prepared calamine;[12] and Dr. Herbert Barker, of Bedford, states[13] that, as one of the late Mr. Liston's dressers, he had ample opportunities of observing the good effects of the

[1] 'Lancet,' 1842-43, vol. ii, p. 628.
[2] Ibid., May 8, 1858, p. 459.
[3] 'New York Med. Rec.,' May 1, 1874.
[4] 'Lancet,' 1844, vol, i, p. 478.
[5] 'Prov. Med. and Surg. Journal,' 1852, p. 307.
[6] Ibid., 1842-3.
[7] 'Med. Times and Gaz.,' vol. xxi, 1850, p. 29.
[8] 'Prov. Med. Journal,' 1849, p. 715.
[9] 'Lancet,' Aug. 28, 1858, p. 233.
[10] 'Lancet,' 1849, vol. ii, p. 637.
[11] 'American Journal of Med. Science,' July, 1860, p. 284.
[12] 'Prov. Journal,' 1848, p. 18.
[13] Ibid., 1848, p. 76.

external application of flour, and so convinced was Liston of the superiority of that over all other preparations, that he proscribed everything besides. Moreover, Mr. Erichsen, whose experience is admitted, and whose pamphlet on the 'Pathology of Burns' is well worth perusal, says, in reply to my inquiry made recently, that he considers flour thickly dusted on as being on the whole the best application.

M. Gouyon used powdered Venice talc for burns;[1] and Mr. Fincham's plan was to apply a lotion of one part of chlorinated soda to six of water.[2]

Dr. S. Judkin dissolved white lead and flax-seed oil to the consistence of cream, and applied the mixture with a light feather.[3]

Dr. A. D. Binkerd, writing in the 'Philadelphia Medical and Surgical Reporter,' July 9th, 1870, prefers as an application to burns when first seen carbolic acid and glycerine in the proportion of from five to ten drops of the former, thoroughly incorporated with two ounces of the latter, spread on with a camel's-hair or other light brush; then a layer of cotton wool, over which a roller bandage is neatly adjusted. The administration of a fourth to half a grain of the sulphate of morphia as early as practicable has been producive of beneficial results. For the suppuration following burns he recommends the following dressing:

℞ Yellow wax, melted and strained, ʒj;
Raw linseed oil, ʒiij;
Tannin, ʒj;
Subnitrate of bismuth, gr. xx.

The wax must be first melted, the oil must then be added, and the whole stirred until incorporated; next the tannin must be added; and lastly the bismuth.

Professor Richardson, of New Orleans, recommended a mixture of bismuth to be rubbed up with glycerine to form a thick paste.[4] Dr. de Breque suggested the following liniment:[5]

[1] 'Med. Times and Gazette,' June 24, 1865, p. 653.
[2] 'Lancet,' Jan. 26, 1867, p. 113.
[3] 'Med. Times and Gaz.,' April 1, 1871, p. 386.
[4] 'North American Med.-Chir. Rev.,' July, 1860, p. 656.
[5] 'Lancet,' Oct. 18, 1873, p. 563.

℞ Hydrate of lime, gr. xlv;
Glycerine, ʒv;
Chloric ether, drops xlv.

It makes, he says, a transparent colourless liquid with an agreeable odour, and has an alkaline reaction. It calms pain and abates inflammation.

The application of cotton wool was discovered by accident in the United States, and was first used in England by Dr. Ogier Ward when he was a student at St. Bartholomew's Hospital. Dr. Ward, however, confesses to its objection, particularly during summer, from the fetor of the discharges.[1]

Dr. Anderson, of Glasgow, believes that cotton wool acts with a twofold effect:—1st, by excluding the air; and, 2ndly, by absorbing the effused serum or pus, and being a non-conductor, he thinks, is the best substitute for the lost cuticle.[2]

Mr. Johnson Smith, of the Seamen's Hospital, Greenwich, approves of cotton wool, and especially of chloralum wool, as it is an excellent antiseptic; and Mr. H. L. Snow, of Shrewsbury, recommends oakum dressing.

M. Giraldès relies on the complete exclusion of air. It may be effected by applying cotton wool or a coating of gum arabic, or any fatty matter. He says that during the American war slices of fresh bacon were employed with the best results.[3]

Mr. Jesse Leach advocated the use of treacle. The following extract from the 'London Medical Gazette,' vol. xxiii, p. 192, will explain his views:—"In the first and second stages of burns," he says, "I prefer the external use of treacle, which, from its simplicity, readiness of access, comparatively little expense, and almost uniform success, cannot fail to recommend itself to every one. Before trying the use of treacle I attempted cold water and spirituous dressings protected with oiled silk, linseed oil and lime water; but frequently failed in preventing the smarting burning pain arising from the sensitive state of the cutaneous nerves, till it occurred to me that treacle, being a tenacious, plastic, refrigerant liquid when pure, would effectually exclude atmospheric air, while it would astringe and cool the inflamed part."

[1] 'Prov. Med. Journal,' 1848, p. 132.
[2] 'Glasgow Med. Journal,' vol. i.
[3] 'Lancet,' Feb. 19, 1870, p. 268.

Mr. Bulley, of Reading, used lint dipped in *diluted* treacle, one part in three of water, and insisted particularly on the mixture being used at 98°, the temperature of the body.[1]

Warm-water dressing, too, has its advocates. Mr. Wills, of Crewkerne, states that in his opinion it is the most pleasant application to the patient.[2]

Mr. Higginbottom, of Nottingham, who used nitrate of silver extensively in cases of erysipelas, gives the following formula for burns, which he conceived to be preferable to all others:

℞ Nitrate of silver, ϑviij;
Nitric acid, drops xij;
Distilled water, ℥j.

He approves of this strong solution, and says that in burns and scalds one slight application on the inflamed surface and two upon a denuded surface will be found sufficient.[3]

Mr. Skey's favourite application was a solution of nitrate of silver. In a clinical lecture delivered in 1870 he remarked,[4] "Now observe, this treatment by carron oil, be it good or bad, affords no relief from the exquisite suffering caused by a large burn, the pain of which continues uninterruptedly for several days, depriving the sufferer of sleep and indirectly of food." He then recommends a remedy he has resorted to for many years, viz. "a solution of nitrate of silver in a strength proportionately to the extent and severity of the burn, from five to ten grains to the ounce of water." He concludes by saying, "My advice to you is to abjure carron oil and all demulcents, and to adopt the treatment of burns and scalds by local stimuli."

Dr. Kalt[5] recommends the following formula:

℞ Nitrate of silver, ʒiij;
Distilled water, q. s.;
Linseed oil, Oj.

By the courtesy of the gentlemen whose names are appended to the respective reports, and to whom I beg to express my

[1] 'Prov. Med. Journal,' 1848, p. 155.
[2] Ibid, 1848, p. 104.
[3] 'Prov. Med. Journal,' 1848, p. 158.
[4] 'Lancet,' Aug. 27, 1870.
[5] 'Prov. Med. Journal,' 1852, p. 307.

obligations for answering my inquiries, I am enabled to place before the reader the treatment adopted at the present time (January, 1875) in some of the metropolitan and other hospitals:

St. Bartholomew's Hospital.—"Mostly by carron oil and cotton wool, followed, if necessary, by poultices and then some simple dressing."—W. H. Patmore Sheehy, House Surgeon.

Charing Cross Hospital.—"Carron oil, *i. e.* a fresh mixture of lime water and olive oil, equal parts, and the after-treatment varying according to the case."—John W. Taylor, House Surgeon.

St. George's Hospital.—"Slight cases with Lot. Plumbi; in more severe, carron oil, followed by carbolic oil, and subsequently an ointment of Ung. Elemi, Ung. Sambuci, Copaiba, and calamine cerate."—Wm. H. Bennett, House Surgeon.

Guy's Hospital.—Mr. Durham tells me carron oil and carbolic oil are employed.

King's College Hospital.—Mr. Royes Bell tells me that either carron oil or a mixture of collodion and castor oil is chiefly used.

London Hospital.—"Zinc dressing, B. P., generally lubricated with oil in order to facilitate removal; 'grafting' has been usefully employed."—Fredk. H. Kyngdon, House Surgeon.

St. Mary's Hospital.—"Carron oil, then with zinc ointment or lard rubbed up with castor oil."—W. V. Lindsay, House Surgeon.

Middlesex Hospital.—"Carron oil, then Lot. Plumbi; in some cases Ung. Cretæ."—Ernest Harrold Fenn, House Surgeon.

University College Hospital.—Mr. Erichsen says, in a letter to me, "Burns are being treated somewhat experimentally by means of boracic ointment, carron oil, &c. I consider flour thickly dusted on as being on the whole the best application."—January 15th, 1875.

Westminster Hospital.—Mr. Cowell tells me that carron oil is the usual application.

St. Thomas's Hospital.—As a rule the following formula is employed:—Mix one part of acetic acid with twelve parts of water, and whiting to the consistence of cream, and apply lightly with a brush during effervescence. The injured part may, if necessary, be covered with cotton wool. Carron oil is also occasionally used.

Birmingham General Hospital.—"Carron oil and carbolic oil 1—10, then calamine ointment."—Walter Ottley, House Surgeon.

Bristol General Hospital.—Carron oil, with Acid. Carbol., or Ung. Cretæ. Latterly I have been using with success an ointment called Ung. Laurocerasi, of which the following is the formula:—"Boil twelve laurel leaves in half a pound of lard; let it simmer slowly till the leaves are brown and crisp and the ointment green;" to be used on lint.—Thomas Elliott, House Surgeon.

Bristol Royal Infirmary.—"Lin. Calcis, Ph. Britt., and cotton wool."—Henry M. Chute, House Surgeon.

General Infirmary, Leeds.—"Carron oil or carbolic oil when of great extent of surface and superficial; cotton wool simply in superficial and not extensive burns. Carbolic oil 1—10 to 1—30 hardens the surface and diminishes sensibility."—George Rowell, M.D., House Surgeon.

Northern Hospital, Liverpool.—"Carron oil or lead and opium lotion, or weak carbolic acid oil."—J. A. Harris, M.D.

Royal Infirmary, Liverpool.—"Carron oil, and then lead and opium lotion, but I think the application of chalk and acetic acid the best."—Herbert A. Lawton, House Surgeon.

Royal Infirmary, Manchester.—"First an ointment called Cerat. Resinæ Acid., *i. e.* equal parts of Ung. Resinæ and Ung. Zinci with carbolic acid, ℥ij ad ℥j. It causes a little pain, which soon passes off."—E. Arnold Birch.

Newcastle Infirmary.—"Lint soaked in carron oil."—Geo. F. Beatson, House Surgeon.

Sheffield General Infirmary.—"Olive oil; charcoal poultice, if necessary. I think lint dipped in olive oil causes less pain than warm-water dressing."—Arthur H. Laver, House Surgeon.

Belfast General Hospital.—"Lin. Calcis, with a little carbolic acid applied on lint and then covered with cotton wool and bandages."—William Whitla, Senior Resident Surgeon.

Jervis Street Hospital.—"Lin. Calcis covered with cotton wool; flour for the face."—C. R. Egan.

Mater Misericordiæ Hospital, Dublin.—Mr. Charles Coppinger says, "Lin. Calcis, or carron oil and cotton wool."

Mercer's Hospital, Dublin.—Mr. E. Ledwich uses carron oil and wadding. Thinks carron oil a dirty application, but useful.

Queen's College, Galway.—Dr. John Cleland says that—1st, he uses cotton wool; 2nd, olive oil and carbolic acid (1 to 100); 3rd, saturate sloughs with pure creasote; 4th, he employs a solution of permanganate of potash; and, 5th, that he never uses poultices.

Dr. Steeven's Hospital.—"Lin. Calcis (B. P.) or barm poultices or Ung. Cretæ, or Lot. Boracis, gr. 10 ad ℥j. They tried powdered clay; it allayed irritation, but it was abandoned because it was so dirty."—F. W. Warren, House Surgeon.

St. Vincent's Hospital, Dublin.—Dr. Quinlan says, "We treat burns and scalds in the ordinary way as laid down in surgical works."

From the above evidence it is clear that the carron oil, or the mixture of linseed oil and lime water, is at the present time the popular remedy; yet I cannot help expressing the opinion, and I do so with much deference, that in many cases the whiting and vinegar treatment is greatly to be preferred. Its peculiar advantages are—1st, that it relieves pain in most cases instantly; 2nd, that it is essentially a clean application; and, 3rd, that it does not soil the sheets or clothes, as all oily applications do, especially the linseed oil.

A letter appeared in the 'Times' newspaper in February, 1863, respecting this treatment, and a correspondent to the 'Lancet' gave the following formula, which differs but slightly from that employed at St. Thomas's Hospital:—"Take chalk and linseed or common olive oil, and mix them in such proportions as will produce a compound as thick as thin honey; then add vinegar so as to reduce it to the thickness of treacle; apply with a soft brush or feather, and renew the application from time to time."[1] The writer continues that he was called to see a child who had been scorched about the arms and neck. On his arrival he found a kind neighbour of the child's parents applying, as he thought, the mixture described, but the vinegar had been omitted. The child seemed in terrible agony, and could scarcely be held. He immediately added vinegar to the two other articles, removed the rags which had been previously smeared over, and covered the part with the slightly effervescing mixture, and in half a minute the little sufferer ceased to struggle and scream.

[1] 'Lancet,' Feb. 28, 1863, p. 257.

I can confidently assert that from my personal experience this is no exaggerated statement, for at St. Thomas's Hospital we see daily the soothing effects of the application, and, notwithstanding this evidence of the value of the vinegar, I feel sure that whiting rubbed with water alone is especially serviceable in the superficial or erythematous burns. A particularly good illustration of the efficacy of this plan of treatment recently came under my observation in a little boy, a patient of Dr. Hall's, of Hornsey, whose fingers were burnt with lucifer matches. The injured parts were immersed in a mixture of whiting and water.[1] Relief was complete whilst the fingers were in the fluid, but the moment they were withdrawn the child screamed with agony. The remedy was continued for five hours, when it was found that the patient could bear the exposure to the air, after which zinc ointment was applied. The treatment with either whiting and vinegar or whiting and water possesses the signal advantage that the ingredients are to be found in every household.

The Sequels of Burns and Scalds.

Besides causing death by perforating ulcer of the duodenum, &c., burns and scalds are occasionally followed by chorea or tetanus. I remember a case of chorea that was under the care of the late Mr. Partridge, at King's College Hospital. The patient was a girl aged fifteen, who had a not very extensive scald on the front of the chest. She was progressing favorably for a fortnight, when the symptoms came on. She ultimately recovered.

An example of tetanus, in a girl aged seventeen, was under my own care at the Westminster Hospital. She was burnt extensively but superficially on the abdomen and thighs by her clothes taking fire. She died of tetanus, which appeared about ten days after she was admitted into the hospital.

At St. Thomas's Hospital a case is reported in which tetanus followed a scald; the patient was cured by hydrate of chloral.[2] Erysipelas may supervene on these injuries, as in a case reported from the Hull Infirmary.[3]

Contractions after burns.—To prevent deformity it is, of

[1] This was recommended in the 'Times' newspaper in February, 1863.

[2] 'St. Thomas's Hospital Reports,' 1872.

[3] 'Brit. Med. Journal,' May 17, 1862.

course, important to keep the wound open as long as possible, for, as Dupuytren has said, "the desideratum is to obtain a cicatrix whose extent should be equal to that of the destroyed skin, or even somewhat greater on account of the contractile property of the new texture." Moreover, after cicatrization has been completed, the part should be kept well extended for at least twelve months with a suitable instrument. This is most especially necessary in the region of the neck, and the use of such an apparatus as this (Fig. 1), originally devised by

FIG. 1.[1]

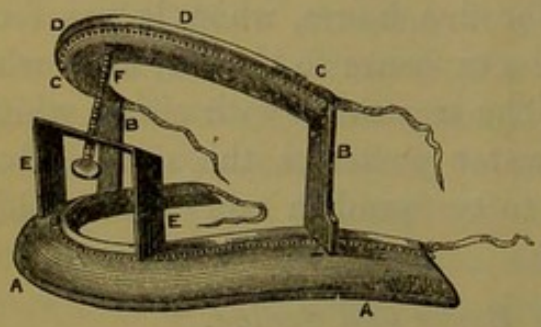
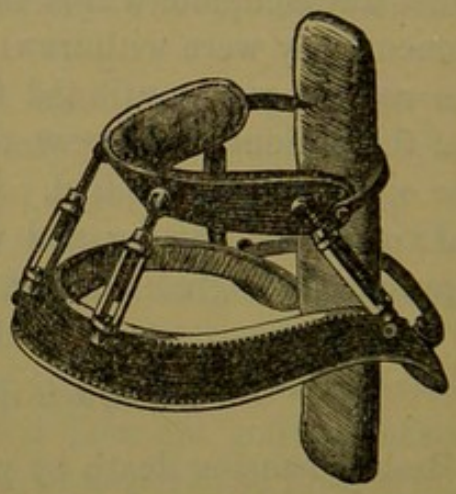


FIG. 2.



Mr. James, of Exeter, in 1818, is usually followed by excellent results. A more modern one, however, having four screws to raise and depress the upper collar, and a head-piece such as this (Fig. 2), is still more advantageous. Professor Quain designed and first used such an instrument at University College Hospital.[2]

Mr. George Pollock has suggested an ingenious contrivance to retard cicatrization in a burn sustained by a patient whose

[1] This woodcut is taken from Mr. James's paper, "On the Removal of Cicatrices from the Neck consequent on Burns," which appeared in the 'Med.-Chir. Soc. Trans.,' vol. xiii, 1827; and a somewhat similar appliance is described, with a sketch, in 'Cases and Remarks in Surgery,' by Benj. Gooch, 1758, p. 26.

A, A. An arch, slightly curved, to adapt it to the form of the parts resting on the sternum and clavicle, and carried back far into the neck.

B, B. Two uprights, with hinge at C, C, situated nearly under the angles of the jaws.

D, D. Another arch, which is applied beneath the base of the jaw.

E, E. A steel frame, which supports the upper arch, with a screw (F) passing through it, by means of which the upper arch may be elevated at pleasure.

[2] 'Association Med. Journal,' July 12, 1856, p. 583.

injuries involved the axilla and the opposite surfaces of the chest and arm. It consisted of a piece of vulcanite cord of about the diameter of an ordinary drainage tube, which was suspended so as to occupy the angle of the axilla. The extremities of the cord were attached to two pieces of tape, one of which passed over the shoulder of the same side, the other over the opposite shoulder."[1]

The Pathological Characters of Cicatrices from Burns.

The contraction after burns seems to be due chiefly to the diminution of vascularity, the result of which is diminished growth and development of granulation cells. The destruction of the sebaceous and sweat-glands, too, favours the contractility. The late Mr. Gray carefully examined the structure of cicatrices, and pointed out—

1st. That the almost entire absence of the yellow elastic tissue in the cicatrix of burns and the density of the new material, the white fibrous tissue, fully account for the great contraction and inelastic property of these cicatrices.

2nd. That the skin when destroyed is repaired, like most other textures, by the formation of fibrous tissue, and consequently follows the same law that appears general with regard to the re-formation of almost all structures.[2]

M. Jobert,[3] referring to cicatrices, says, "If we examine a cicatrix that is completely formed we find that it consists in, 1st. A thin superficial membrane, which, although sometimes rugous, is usually smooth, shining, and, from the absence of secretion, dry. 2nd. Below this there is a peculiar tissue, which may be compared to ligamentous tissue. 3rd. Arteries and veins, small in number and in size, are found in the centre and midst of this substance. 4th. Although the existence of lymphatics has not been demonstrated, it is highly probable that they accompany the blood-vessels. 5th. The careful dissection of a great number of cicatrices has never shown M. Jobert the slightest trace of nerves, but he has always found the nerves of the surrounding parts terminating at the periphery of the cicatrix

[1] 'Lancet,' Dec. 16, 1871, p. 849.

[2] 'Path. Soc. Trans.,' vol. ii, 1848-50, p. 289.

[3] 'Gazette des Hôpitaux,' No. 63.

in little gangliform swellings exactly analogous to those found at the end of stumps after amputation.

The *probable disappearance of cicatrices* is a point on which there has been much discussion, especially in a medico-legal aspect. Mr. W. Adams read a very interesting paper on this subject at the Medical Society of London, November 17th, 1873, and alluded to four cases, amongst them one of a young lady who, when a baby a year old, was operated on for nævus by excision in the region of the breast. The scar left at the time was less than an inch and a half, but at nineteen years of age it was found to have increased enormously, measuring three inches in length. The case showed that when a portion of skin had been destroyed the cicatrix appears to be persistent through life, and to grow *pari passu* with the rest of the body, or rather with the portion of the body over which it may be placed. The increased size of the vaccination scars observed in the adult, he thought, proved this. Sir James Paget puts the case well when he says, "The scar of a child when once completely formed commonly grows as the body does, at the same rate, and according to the same general rule; so that a scar which the child might have said was as long as his own forefinger will still be as long as his forefinger when he grows to be a man."[1]

Other *pathological changes* occasionally occur in cicatrices. Thus during last summer (1874) I saw amongst the out-patients at St. Thomas's Hospital a man, aged 63, who said that forty years previously he was severely burned on the front of the leg by molten lead. The limb had healed and remained well until a year before he applied, when the cicatrix began to ulcerate, and when I saw him the wound had enlarged to the size of the palm of the hand. Mr. Bryant alludes to a somewhat similar case in a patient, aged 48, who was burned thirty years previously.[2] Sometimes warts or cancerous growths are found on cicatrices after burns, and occurring, too, at a distant period in life. Professor Humphry alludes to four such cases, two in which the cancer appeared in a scar of sixteen years' duration, and one in a scar of twenty years' duration; the fourth was stated to have been in a very old scar.[3] And Dr. F. W. Davis showed

[1] 'Surgical Pathology,' p. 37.

[2] 'Med. Times and Gaz.,' Feb. 3, 1872.

[3] Ibid., Jan. 19, 1861, p. 62.

at the Pathological Society in 1861 a case of malignant ulcer in a cicatrix which had been removed from a man aged 81. Mr. Flower, too, has placed on record a very interesting example of epithelial cancer in the cicatrix of a burn on the arm which was under his care at the Middlesex Hospital. The patient, a woman, aged 27, was burned when nine years old, and in consequence of the scars spreading it was found necessary to amputate at the shoulder-joint.[1]

I have seen a few cases of *keloid* in cicatrices after burns, and I may refer to one in particular which was under the care of Sir W. Fergusson when I was house surgeon at King's College Hospital. The patient was eighteen years of age, and was severely scalded when he was twelve years old. The case so much resembled one that was under Mr. Curling's care, the woodcut of which he has kindly placed at my disposal (Fig. 3), that the one might be easily mistaken for the other.[2]

Fig. 3.

[1] 'Med. Times and Gaz.,' April 16, 1859, p. 390.

[2] Ibid., Nov. 26, 1859.

As in Mr. Curling's case, the growth kept recurring after removal. Three operations were performed, and ultimately the patient was discharged cured.

Cases of Plastic Surgery.

The two following cases, which have been recently under my care at the hospital, are selected as affording good illustrations of the advantages of plastic surgery:

Case 1.—Charles F—, æt. 3, was admitted into St. Thomas's Hospital, Victoria Ward, on August 23rd, 1873. The accompanying engravings (Figs. 4 and 5) show the condition of the little patient before and after the operation.

Fig. 4.

Charles F—, æt. 3.

Fig. 5.

Charles F—, after operation.

His mother stated that when he was fourteen months old he was severely scalded by boiling tea. He was under medical treatment and made a rapid recovery, but no splint nor any other mechanical appliance was used.

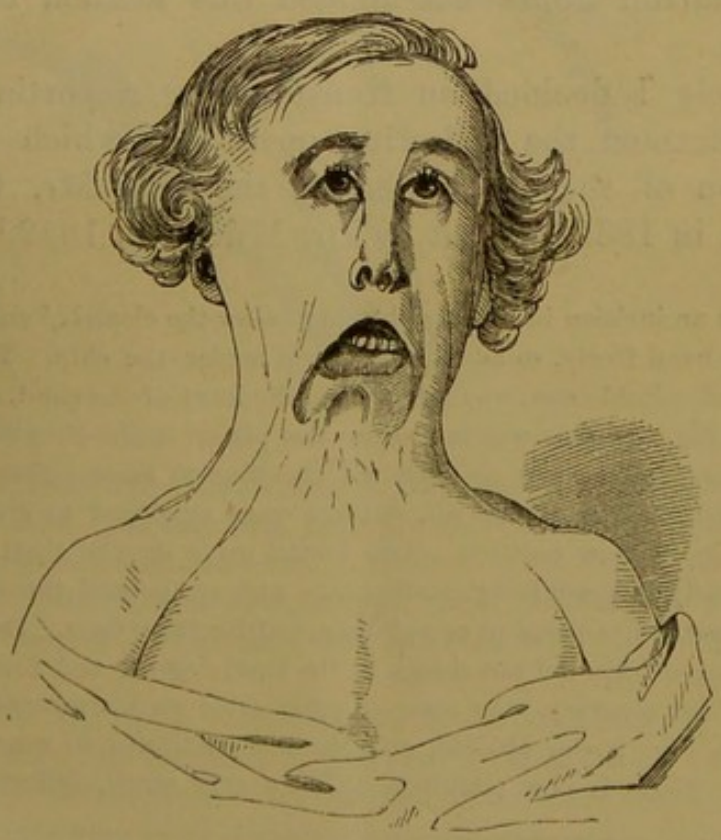
When he was admitted the parts presented the following appearance:—On the right side of the neck there was a strong, tight, cicatricial band, extending vertically from the under surface of the body of the jaw to the clavicle, behind which, and extending over the shoulder and back, the skin was deeply involved. Immediately under the jaw was a transverse solid cicatrix, commencing at the ear and passing forwards and reaching the chin; this was three quarters of an inch in depth, was tough, and had the characteristic bright glazed and knobbed surface. The angle of the mouth was drawn down considerably, and the jaw itself, with the corresponding teeth, was steadily becoming everted; this eversion had rapidly

increased during the last few months.[1] The patient was an intelligent lad, and feeling the daily increasing restraint, had repeatedly asked his mother to lend him a knife to divide the band.

On considering this case I at first intended to try (thinking it was not an unsuitable case) Earle's plan of removing the cicatrix. Again, I might have adopted James's method of dissecting up the band and using an apparatus (see Figs. 1 and 2), relying on extension alone; and I might have followed Mr. Torry Hester's practice to make a V-shaped incision on each side, and dissecting the cicatrix well up under the chin to bring the lower edges together with plaster, thus converting the V into a Y. Mr. Hester thus describes the operation in a case of a contraction extending from the chin to the sternum:

Two incisions were made, each extending from the angle of the jaw to the level of the lowest part of the sternum, where they terminated about an inch and a half apart, and a cross cut was made from one to the other. The cicatrix was then dissected up to the chin and the wound on the chest brought together by strapping.[2] The accompanying woodcuts (Figs. 6 and 7) show a patient before and after such an operation.

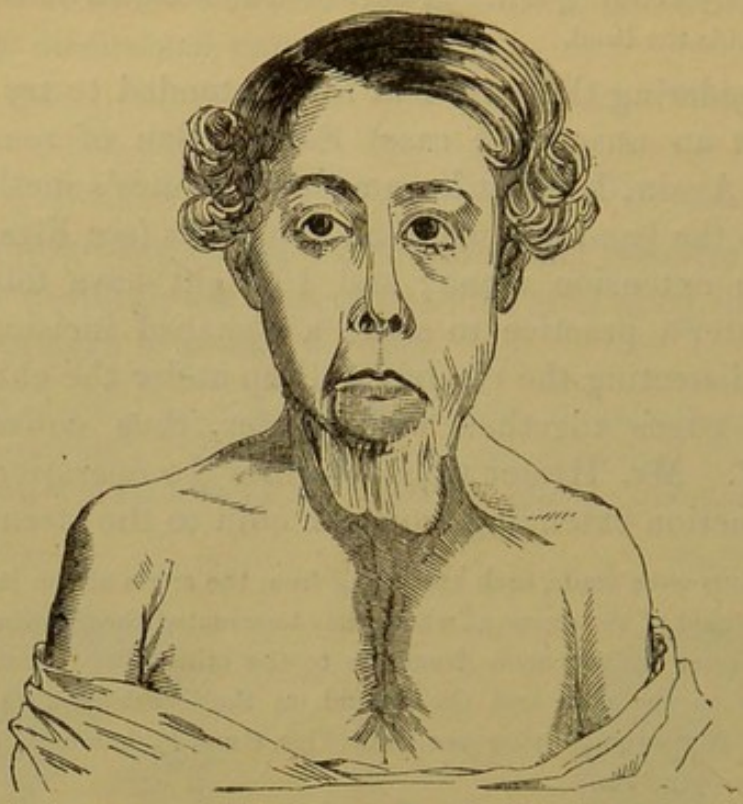
Fig. 6.



[1] For examples of deformity of the lower jaw from burns the reader is referred to the 'Trans. Path. Soc.,' vol. ii, p. 241, Mr. Shaw's case, and to vol. vi, p. 171, Mr. Vasey's case.

[2] 'Med. Times and Gaz.,' March 22, 1851.

Fig. 7.



Mr. Wharton Jones has applied this method to cases of ectropium.

Ultimately I decided on transplanting a portion of skin, and I performed the following operation, which is a slight modification of that suggested by the late Mr. Carden, of Worcester, in 1839, or that by Dr. Mütter in 1842.[1]

I first made an incision in the healthy skin below the cicatrix,[2] and dissected up the cicatricial band freely, so as to pack it well under the chin. Then a flap of healthy skin, of suitable size, was taken from the front of the chest, as indicated in the woodcut (Fig. 4); this was turned up and placed in the situation of the cicatrix. Great care was taken to allow all bleeding to cease before the flap was finally adjusted, and numerous silk sutures were employed to keep the transplanted skin in its new position. The wound made on the chest was brought together as nearly as possible by harelip pins and straps and the whole covered with cotton wool. The parts were not disturbed for three days. It will suffice to say that the flap of skin did not slough in the least degree, and that the patient made an excellent recovery. As soon as practicable an instrument of the kind represented in Fig. 2 was applied, and the boy continued to wear it for more than a year. There is now (October, 1874) a very small, delicate, and highly

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[1] 'Brit. and For. Med. Rev.,' April, 1845; 'Prov. Med. and Surg. Journ.,' vol. xii.

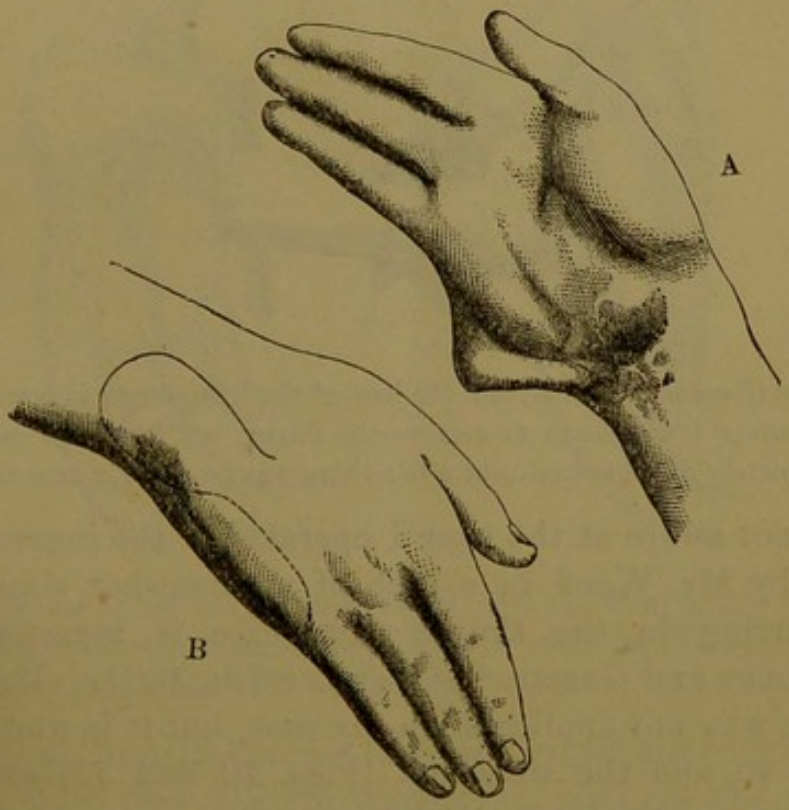
[2] Carden divided the cicatrix itself, and so did Mütter.—'Cases of Deformity from Burns,' 1843, p. 5.

elastic band, of about an inch, under the jaw, but there is no traction whatever on the lip, and on looking at the patient full face it is difficult to suppose that he had been the subject of deformity (Fig. 5).

The second case is one of extreme deformity of the right hand, the result of a burn.

Emily A—, æt. 2½, was admitted into St. Thomas's Hospital, Victoria Ward, under my care, September 1st, 1874. She was severely burned all over the face and the right forearm by her pinafore taking fire ten months before her admission. The little finger of the right hand (Fig. 8, A, an enlarged view from a photograph)

FIG. 8.

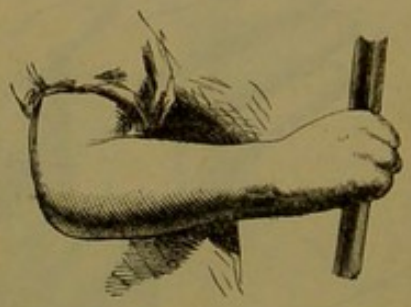


was flexed, and there was a tight cicatrix extending from the palm to the extremity of the digit. Another firm band proceeded from the inner side of the palm to the ulnar side of the forearm. The whole of the front of the forearm and the lower third of the front of the upper arm were involved in the injury. The skin on the back of the forearm was comparatively unimpaired and fairly healthy.

On September 9th, 1874, I operated in the following manner. The patient being placed under the influence of chloroform, I first divided transversely the band extending between the forearm and hand on the ulnar side: an incision was then made, commencing at right angles to the first and carried down vertically on the inner side of the palm, and on reaching the little finger was taken round it elliptically; the little finger was then disarticulated at the metacarpo-phalangeal joint; thus there was an oval-shaped wound on the inner side of the hand, ex-

tending from the wrist to the little finger (Fig. 8, B). A flap of healthy skin, of suitable size, was now taken from the back of the wrist (as shown in the woodcut), and, being turned down, was made to fill the wound already referred to. Numerous stitches of silk were applied, and the wound in the forearm closed, as much as was thought desirable, by harelip pins and strapping, and the whole forearm covered in cotton wool. The dressings were not disturbed for three days, when it was found that a portion of the flap had sloughed. I think this mishap was due, to some extent, to my having drawn the edges of the wound in the forearm rather too tightly. However, ultimately the child made an excellent recovery. She now wears a splint to keep the hand well to the radial side, and this apparatus will not be dispensed with for some months. The engraving (Fig. 9), taken from a photograph, shows the condition of the hand at the

FIG. 9.



present time (December, 1874), and the loss of the little finger is scarcely perceptible. I confess I was loath to remove the finger, but it was so matted down and so completely disorganized that I felt there was no other course to pursue.

I was not aware at the time I operated of the ingenious plan adopted by Mr. Wood in a case of a somewhat similar kind, but occurring in the thumb; the case is reported in the 'Med. Times and Gazette' of October 8th, 1864. The plan of operating was not applicable in my case, but it is worth briefly referring to, and the woodcuts (Figs. 10 and 11) sufficiently explain the method of procedure. A represents the parts before the operation, and B the method of operating, which is thus described:

"An oblong incision was first made across the cicatrix and carried carefully through the deep-seated contracted muscular and other tissues nearly down to the bone, the thumb being at the same time put on the stretch and gradually placed parallel to the axis of the hand. An elliptical or tongue-shaped flap of skin was then dissected from the redundant skin placed over the projecting boss on the outside of the dorsum, having its apex near the front of the root of the forefinger, and its base, broad and thick, towards the wrist and continuous with the palmar incision. This was dissected freely up until it could be turned into the incision upon the palm without much strain or twisting of the root (Fig. 11); it was then stitched by numerous points of suture to the edge of the palmar incision, into

which it exactly fitted. The wound on the dorsum from which the flap was taken was left to heal by granulation, especial care being taken that no tension should be exercised upon the flap in any way.

FIG. 10.

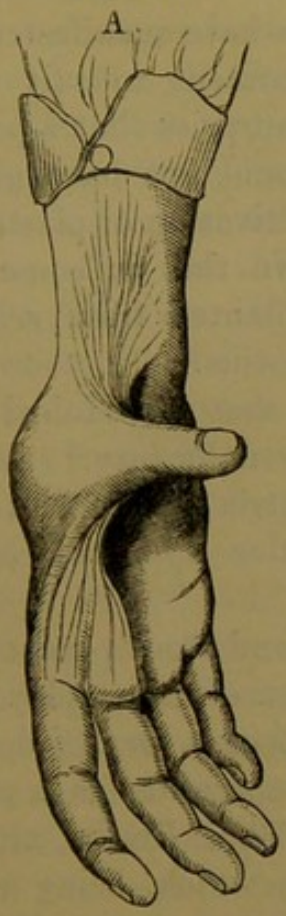
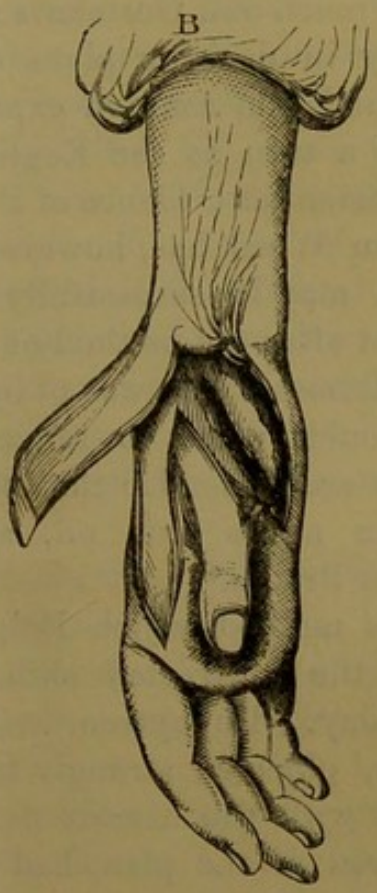


FIG. 11.



"A well-padded splint was placed upon the palm and front of the arm as soon as the healing of the wound permitted. Twice a week the cicatrix was rubbed with oil and the thumb and wrist well worked."

Operations undertaken for the removal of contractions after burns, even if they involve important parts, as the neck, are seldom attended with fatal results, although there is often a good deal of constitutional irritation. In a case of Bransby Cooper's tetanus and death followed the division of a cicatrix in a girl, aged 15. The tetanus came on three weeks after the operation and when the wound was granulating.[1]

I have already expressed my opinion[2] that, as a rule, the most satisfactory results are to be obtained by transplanting a portion of healthy neighbouring skin and inserting it into the wound caused by the division of the cicatrix. Every case must,

[1] 'Lancet,' vol. i, 1827-28, p. 265.

[2] 'St. Thomas's Hospital Reports,' 1872.

however, be judged on its own merits, the surgeon having ample scope to exercise his skill and judgment. Von Ammon has well said, "La chirurgie plastique veut devenir la fleur de toute la médecine opératoire."

The French and German surgeons have manifested no little ingenuity in devising plans of treatment to suit individual cases;[1] and Von Ammon expresses surprise that a people of so practical a turn as the English should not have given some more substantial evidence of their cultivation of plastic surgery. Mr. John Wood has, however, shown that in some examples the skin may be successfully transplanted from *remote* parts somewhat after the method of Taliacotius.[2]

Mr. Holmes Coote was of opinion that mechanical extension alone would suffice to remove the deformity.[3] Mr. Cæsar Hawkins recommended that the cicatrix should be thoroughly soaked in neat's foot oil, a practice approved of by Sir Benjamin Brodie.[4]

Earle's method, which Delpech[5] and South commended, of excising the contracted skin, is not often employed at the present day. Dupuytren, in his 'Leçons Orales de Clinique Médicale,' objected strongly to the operation as a proceeding "fraught with the utmost danger;" but Brodie, although he disapproved of the plan, had a case which, being successful, Earle included by permission in his paper read at the Medico-Chirurgical Society, June 25th, 1816.[6]

Higginbottom rubbed the cicatrix with nitrate of silver, and then covered it with ointment.

It has been proposed to rupture the cicatrix violently under chloroform. This plan seems to derive some support from a curious case that occurred in the practice of Dr. Bagot, who showed to the Surgical Society of Ireland a little boy whose arm had been greatly contracted after a burn. He fell and

[1] 'Dictionnaire Encyclopédique des Sciences Médicales,' tome vii, art. "Autoplastie," and 'Dictionnaire de Médecine et de Chirurgie Pratiques,' tome iv, art. "Autoplastie."

[2] 'Med.-Chir. Trans.,' vol. xlvi, p. 149, and 'Brit. Med. Journal,' May 18th, 1872, p. 525. Much useful information may also be gathered from Mr. Johnson Smith's Jacksonian Prize Essay on 'The Treatment of Deformities from Burns.'

[3] 'Holmes's System of Surgery,' vol. iii, p. 132.

[4] 'Lancet,' 1839, vol. i, p. 742.

[5] 'Velpeau's Op. Surgery,' by Mott, vol. i, p. 380, 1851.

[6] 'Trans. Med. and Chir. Soc.,' vol. vii, p. 411.

ruptured the cicatrix, and although he was not under medical supervision he did very well.[1]

Another method is to insert a steel instrument provided with compressing plates so as to cause a perforating slough. As soon as the hole is healed the cicatrix is divided. Sir W. Fergusson and Mr. W. Adams have operated successfully in this way. The same end may be accomplished by passing a thread through the cicatrix, and after the aperture has cicatrized to divide the contracted skin. This operation was suggested by the late Mr. Tamplin for cases of webbed fingers, and in October, 1874, I showed at the Medical Society a child on whom I had successfully practised this plan of treatment. Again, Dupuytren and Skey advocated small transverse incisions;[2] and Barrow records a successful case in which he divided the cicatrix by degrees every two or three days to five operations.[3]

Mr. James Whitehead, of Manchester, has published an interesting example of cicatrices following very severe burns of the neck, axilla, and elbow, all of which were released by simple division, but the point he *insists* upon is the *complete* division of the subcutaneous fibrous bands.[5]

Mr. Butcher describes an operation which implies the necessity of thoroughly freeing the fibrous bands. After the cicatrix is divided he introduces a narrow knife subcutaneously in all directions at the circumference of the wound, and separates the bands involved in the cicatrix.[6]

The late Mr. Teale's operation is especially applicable to burns involving the lower lip. The accompanying woodcuts (Figs. 12 and 13) from Mr. Teale's work [6] illustrate the operation which he thus describes:

"Two vertical incisions, about three quarters of an inch in extent, are made through the everted lip down to the bone; these incisions are so placed as to divide the upper portion of the everted lip into three parts, the middle being equal to one half of the natural breadth of the lip, while the two lateral portions are each equal to one fourth. From the lower end of each vertical incision the knife

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[1] 'Prov. Med. Journal,' vol. xv, p. 76.

[2] 'Lancet,' vol. i, 1850, p. 184, and vol. ii, 1857, p. 169.

[3] 'Prov. Med. Journal,' 1848, p. 213.

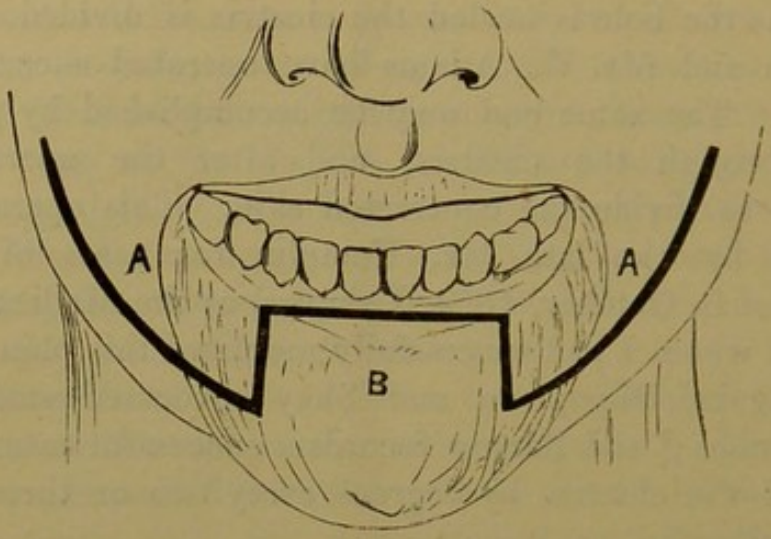
[4] Ibid., Aug. 9, 1848.

[5] Butcher's 'Cons. and Op. Surg.,' 1865.

[6] 'On Plastic Operations,' 1857.

is carried in a curving direction outwards and upwards to a point situated about one inch from the angle of the mouth opposite to the second molar tooth of the upper jaw; the two flaps thus marked out and deeply incised are then separated from

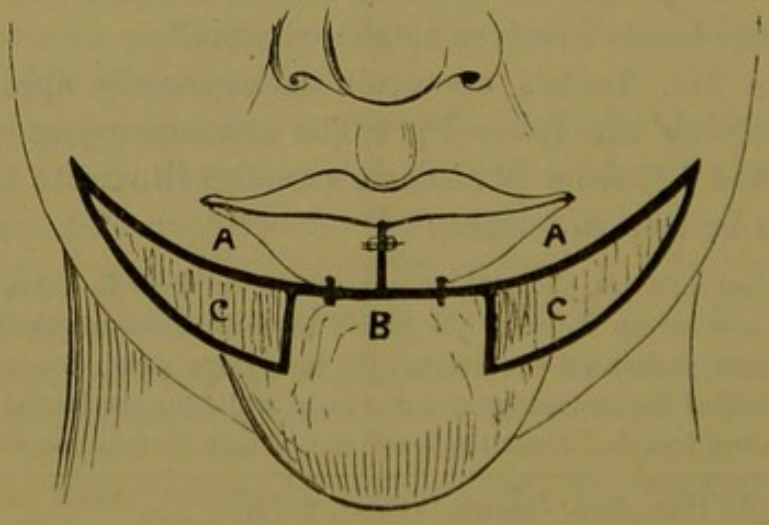
Fig. 12.



A, A. Lateral flaps formed of everted lower lip and cheek. B. Central portion of everted lower lip.

the bone, the mucous membrane uniting them to the alveoli being freely divided; lastly, a bare surface is made along the alveolar border of the middle portion of the everted lip. The incisions being now completed, the lateral flaps are drawn upwards and united by twisted sutures to each other in the median line and to the middle portion of the everted lip at their inferior border. In this way a new lip is, as it were, built upon the middle portion of the old one."

Fig. 13.



A, A. Lateral flaps, united in the median line, above the central portion of everted lower lip (B). C, C. Exposed surfaces left to granulate.

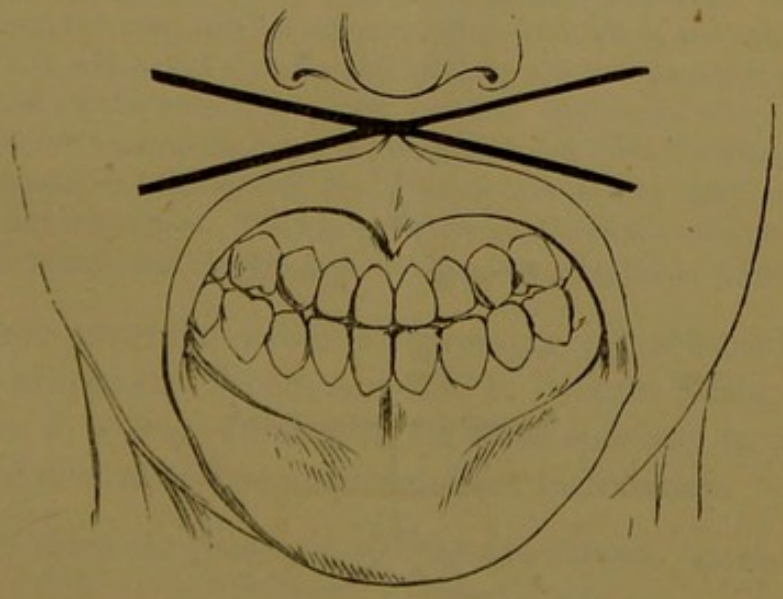
Mr. Teale's operation was specially devised for remedying deformities after burns. I have quoted his description in full

because, as will be observed, the method of procedure differs in some respects from that practised by Mütter,[1] for restoring the lip after its removal for disease, and which I give in his own words:

The patient, a man fifty years of age, was the subject of a cancerous affection involving the entire lower lip. "I proceeded," says Mütter, "to remove the entire diseased mass by a semi-elliptical incision, which started from the commissure of the mouth on one side and terminated at a corresponding point on the other. From the centre of this line two slightly curved incisions were carried downwards and outwards until they reached the base of the inferior maxillary bone. It is obvious that these incisions were separated from each other by a triangular piece of skin, the superior angle of which nearly reached the first incision. Then from the terminal extremity of the lower incisions two others were carried upwards along the base of the lower jaw. Two quadrangular flaps were thus marked out and immediately detached from the subjacent bone. The flaps were raised and placed in the portions originally occupied by the lower lip, and then united to each other in the mesial line, and also by their lower thirds to the triangular piece of integument. By the elevation of these flaps a raw surface on each side was left to heal by granulation."

In operating for the restoration of the upper lip (Fig. 14) Mr. Teale says:

Fig. 14.



"A crucial incision is made, having its point of intersection immediately below the septum of the nose. Each limb of this incision is about one and a half inch in length. The two limbs on each side diverge moderately as they pass outwards to the cheek, and enclose between them an acutely angular flap of skin and other tissues. The crucial incision is extended deeply through the entire substance of

[1] 'Cases of Deformities of Various Kinds,' Philadelphia, 1844, pp. 31, 32.

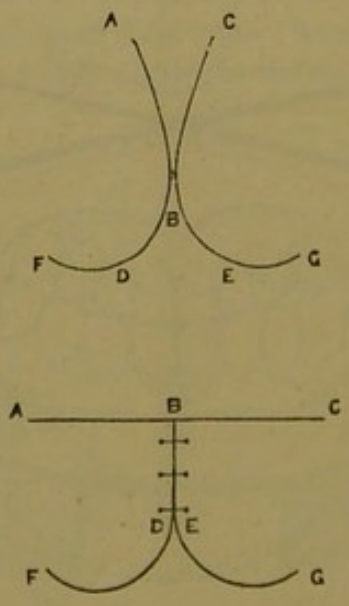
the imperfect lip and the cheeks. The parts implicated in the incision are then freely loosed from their attachments to the superior maxillary bone by the knife being passed upwards between the bone and the remnant of lip. The parts being thus detached, the two lateral angular flaps are drawn across the median line, dovetailing with each other and thereby increasing the depth of the lip at the expense of its breadth. In this position the flaps are retained by one pin and twisted suture."

Mr. Spencer Watson has applied this operation for the relief of deformity resulting from a burn on the neck and face.[1]

Syme's operation is suitable in some cases. It is chiefly useful in restoring the lower lip, but it might be applied in other cases. He thus describes it:

"Two incisions were made from the angle of the mouth, so as to meet at the chin and remove the whole of the morbid part in a triangular form. The lines A, B and B, C (Fig. 15), being supposed to represent these incisions, I cut from the point B outwards and downwards on each side to D and E in a straight direction, and then, with a slight curve outwards and upwards, to F and G. The flaps A, B, D, F, and C, B, E, G, were next detached from their subjacent connections and raised upwards, so that the edges A, B, and C, B, came into a horizontal line, while those represented by B, D, and B, E, met together in a vertical direction, and the lateral

FIG. 15.



extensions to F and G allowed sufficient freedom to prevent any puckering or overstraining."[2]

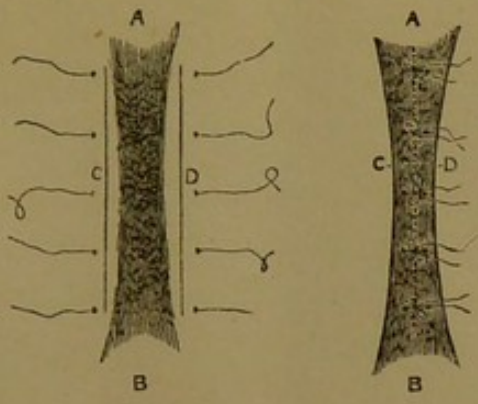
And, lastly, I may refer to a method adopted by Mr. Curling

[1] 'Proc. Med. Soc. of Lond.,' vol. i, p. 104.

[2] Miller's 'Practice of Surgery,' 1856, p. 163.

at the suggestion of Dr. Fabrizi, of Nice. The operation is

FIG. 16.[1] FIG. 17.[2]



thus described, and the woodcuts (Figs. 16 and 17) will probably render the description more intelligible:

"Having seized between the finger and thumb of his left hand the firm band of cicatrix (which passed from the chest to the integuments of the chin), he drew it forward; and it being held in that situation by an assistant, he passed five or six sutures through the sound skin at the base of the band, leaving the silk in the apertures made by the needles. The band of cicatrix being again brought forward, a longitudinal incision was made through the sound skin at the foot of the web, parallel to the line of the sutures but anterior to them. The band, thus separated from the base, was left adherent above and below, and the sutures were tied beneath it, which had the effect of bringing the two posterior edges of the wound formed by the incision into close contact. Six weeks after, Mr. Curling passed a bistoury beneath the firm band of cicatrix and excised a triangular portion of it, thus freeing the left side of the neck and leaving two small wounds above and below, but wide apart. The edges of these small wounds were drawn together by means of sutures and dressed with wet lint; they healed in a few days."[3]

I cannot conclude without expressing my acknowledgments to Mr. Curling, Mr. Wood, and Mr. T. Pridgin Teale, as well as to Messrs. J. and A. Churchill, for their courtesy in permitting me to use several of the woodcuts here introduced.

[1] Fig. 16 shows the method of applying the sutures. C, D, indicate the incisions.

[2] Fig. 17 represents the bridge of cicatrix attached at A, B, but separated from the subjacent tissue, and under which the edges (C and D) are drawn together.

[3] 'Lancet,' Jan. 2, 1858.