

Texts and Documents

Treatment of Burn Scars and Contractures in the early Seventeenth Century: Wilhelm Fabry's Approach

I L NAYLOR, B CURTIS and J J R KIRKPATRICK*

In 1607 in Basle, Wilhelm Fabry (1560–1634) published his comprehensive work on burns entitled *De combustionibus*.¹ At this time Fabry, who had been born in Hilden (a small town near Dusseldorf in Germany), was the “surgeon-in-ordinary” to the town of Payerne in the region which later became the Vaud canton of Switzerland. He held this appointment between 1602 and 1611, perhaps the longest time he was resident in any one place during his life. It was highly productive in terms of publications since he wrote four texts in the space of nine years on subjects ranging from gangrene² to dysentery, as well as two volumes each containing 100 surgical observations.³ Comprehensive details of his life and works can be found in the accounts of Sudhoff and Jones.⁴

De combustionibus was the first book devoted exclusively to the subject of burns. It included a new classification system of burns (into three degrees) and a clear account of their prognosis and, most importantly, of their treatment, which was prescribed according to their severity.⁵

*Dr Ian L Naylor, BPharm, MSc, PhD, MRPharmS, The Reverend Bert Curtis, BCom, BA, and Mr James J R Kirkpatrick, MA, FRCS Eng., FRCS Ed. Address for correspondence: Dr Ian L Naylor, Postgraduate School of Studies in Pharmacology, School of Pharmacy, University of Bradford, Bradford, BD7 1DP.

The authors would like to thank: the Royal College of Surgeons of England, London, for allowing us to peruse their copies of the works of Fabry and Steer; the British Library, London, for permission to reproduce Figures 1a and 2; the Thackray Medical Museum Library, Leeds for supplying Figure 1b, and for allowing us to read their copies of Uffenbach's *Thesaurus chirurgiae*, the English translation of Paré's works and Melcher's catalogue of surgical instruments; the Wellcome Institute Library, London, for permission to reproduce Figures 3, 4 and 5; and finally, Dr J K Sowden, senior lecturer, Department of Modern Languages at the University of Bradford, for his help in translating the paper by Sudhoff.

¹ G Fabricius Hildanus, *De combustionibus*, Basle, Carolus Uttenhove, 1607.

² G Fabricius Hildanus, 'De gangraena et sphacelo. Tractatus methodicus in quo horum morborum differentiae, causae, signa, prognosis; ac denique methodica curatio', in Dionysius Fontanonus, *De morborum internorum curatione, libri quattuor*, Lyons, Antonius de Harcy, 1605, pp. 707–839.

³ G Fabricius Hildanus, *Observationum et curationum chirurgicarum, centuria I*, Basle, Ludovicus Regis, 1606; *idem, Observationum et curationum cheirurgicarum, centuria secunda. Epistolis nonnullis virorum doctissimorum, nec non instrumentis cheirurgicis, ab authore inuentis illustrata*, Geneva, Petrus et Jacobus Chouët, 1611.

⁴ Karl Sudhoff, 'Guilhelmus [sic] Fabricius Hildanus', *Münchener Medizinische Wochenschrift*, 1910, 20: 1401–3; Ellis Jones, 'The life and works of Guilhelmus Fabricius Hildanus (1560–1634)', *Med. Hist.*, 1960, 20: 112–34, 196–209.

⁵ James J R Kirkpatrick, Bert Curtis, Aidan M Fitzgerald and Ian L Naylor, 'A modern translation

After its publication in Basle, the first edition of *De combustionibus* was published again in Oppenheim, Germany, in 1614.⁶ A version was included as a chapter in the surgical thesaurus edited by Peter Uffenbach in 1610.⁷ A Dutch edition was published in Amsterdam in 1627.⁸ A reprint of the second edition may be found in a 1641 compilation of some of Fabry's works published in France⁹ (a copy of this is held at the Wellcome Institute Library, London). The third and final edition is found in the 1646 comprehensive collected edition of his writings.

Karl Sudhoff praised the treatise thus: "he [Fabry] published his book on burns first in 1607 which gave splendid testimony of his enormous experience, his versatile and inventive techniques and an unerring sense of purpose in the treatment of scar retraction and contracture".¹⁰ Pieter Paaw (1564–1617), the then eminent professor of anatomy and botany at the University of Leiden, read the first edition of the book and wrote a letter to Fabry on 18 April 1612, in which he enthused about the clarity and originality of the treatments and stated he would recommend it to be read by all his surgical colleagues. This letter was later included as part of Fabry's collected works, and also in the form of a preface to *De combustionibus*.¹¹ Our translation follows:¹²

Opinion of Pieter Paaw

My dear Sir, I was pleased to learn that our exchange of correspondence has proved most satisfactory since I gather you found it so yourself. Your letter of the 29th March from Cologne in which you enclosed your treatise on Burns not only was a pleasure to

and interpretation of the treatise on burns of Fabricius Hildanus (1560–1634)', *Br. J. plast. Surg.*, 1995, 48: 460–70.

⁶ Jones, op. cit., note 4 above, p. 209.

⁷ Peter Uffenbach, *Thesaurus chirurgiae, continens praestantissimorum autorum, utpote Ambrosii Parei Parisiensis, Joannis Tagaultii Ambiani Vimaci, Jacobi Hollerii Stempiani, Mariani Sancti Barolitanii, Angeli Bolognini, Michaelis Angeli Blondi, Alphonsi Ferrii Neapolitani, Jacobi Dondi, et Guilelmi Fabritii Hildani. Opera chirurgica in quibus non solum perfectissima, tumores praeter naturam, vulnera, ulcera, luxationes et fracturas ratio curandi; verum etiam humani corporis singularumque partium exactissima anatome; curationes item multorum aliorum affectuum, raras observationes et varia medicamenta ad chirurgiam pertinentia demonstrantur. Ante hac quidem disjunctim edita; nunc vero in unum collecta et ab omnibus mendis repurgata, per Petrum Uffenbachium, Republ. Francofurtiensis ad Moenum physicum ordinarium*, Frankfurt, Jacobus Fischerus, 1610, pp. 1139–64.

⁸ Wilhelm Fabricius von Hilden, 1560–1634, *Corte ende claer tractaet van de verbrantheydt: welck gheschiet door siendende olie, heet water, gloeyende yser, busch-pouder, blixem ende dierghelijcke brandende materie, In welck de verscheydenheden, tekenen, voorsegginghe ende cure, soo des verbrandtheydts, als mede by-na aller*

accidenten, ofte toe-vallen des selves beschreven ende klaerlijck verthoont worden. Eerst in de latijnsche tale uytghegheven door . . . ende nu van woordt tot woordt in de nederlandsche tale verduytschet door Johannes Burgundus, in his: *Een singuliere ende voortreffelijcke observatie* (etc.), Amsterdam, 1627, pp. 12–24. This reference was provided by the *National Union Catalog (Pre-1956) Imprints*, London, Mansell Information, 1971, vol. 165, p. 332, column 1, item 3.

⁹ G Fabricius Hildanus, *Observationum et curationum chirurgicarum centuriae, nunc primum in unum opus congestae, ac in duo volumina distributae. Quorum prius continet centurias I, II and III*, Lyons, J A Hugnetan, 1641.

¹⁰ Sudhoff, op. cit., note 4 above, p. 1402.

¹¹ G Fabricius Hildanus, *Opera observationum et curationum—chirurgicarum quae extant omnia*, Frankfurt am Main, Joannis Beyer, 1646, pp. 1020–1. The letter appears as number 89 in the section 'letters to friends' in this *Opera* ('Epistolarum ad amicos, eorundemque ad ipsum Centuria Una in quibus passim medica, chirurgica, aliaque lectione digna continentur', pp. 958–1033); *idem, De combustionibus*, 3rd edn, in *ibid.*, pp. 918–34.

¹² The translation of this letter is reproduced with the permission of the Editor, *British Journal of Plastic Surgery* from Kirkpatrick, Curtis, Fitzgerald and Naylor, op. cit., note 5 above, p. 463.

have, but I immediately read and re-read it avidly. I have no hesitation in saying that I have never read anything on the subject which bears comparison to your most learned work, either as regards your observations and procedure, your pertinent diagnosis or, what impressed me most of all, the originality of your treatments.

I shall cherish your little book and shall so recommend it to our surgeons that it will prove of the utmost assistance to many. I confess to you, dear Sir, that I owe a debt to many, and that your name will always be most dear to me, not merely because you express your friendship in words but you do it with gifts which I cannot possibly repay . . .

The collected works contain the “final” copies of Fabry’s writings which he continually revised and updated throughout his life. In all editions, the book was divided into 16 chapters. Chapters 14 (‘Unsightly scars and their removal’) and 15 (‘Retracted sinews and curvature of the joints consequent upon burns’) deal specifically with scar modification by both novel surgical and pharmaceutical methods. It is a translation of these chapters from the third (and therefore last) edition which we present.¹³

The only other English version was translated by the London surgeon John Steer in 1643, and therefore contains many words which are now obsolete.¹⁴ In addition it is marred by frequent repetitions and inaccuracies in translation and is, indeed, incomplete, omitting, for example, some of the formulae. Furthermore, these formulae were not translated into English. In the United Kingdom, we have been able to trace only two copies of Steer’s book, one each in the British Library and in the library of the Royal College of Surgeons of England.

Steer’s translation does, however, contain illustrations of two different instruments used in the progressive correction of limb burn contractures, along with explanatory notes on their use (see Figures 1a, 2a and 2b).¹⁵ The first of these instruments was said by Fabry to have been shown in the works of Ryff,¹⁶ though the second was his own invention. Although Fabry omitted this section from the third edition we have nevertheless included

¹³ Fabry compiled the *Opera* himself and, after completing it, sent it to the printers in Frankfurt in 1634, the year of his death. However, because of the turmoil in Germany during the Thirty Years War, printing and publication were delayed until 1646. The third edition of *De combustionibus* was therefore the last version, and was sanctioned by Fabry himself, even though it did not appear in print until several years after his death. The fact that both second and third editions of *De combustionibus* appear in versions of the *Opera* as provided by different publishers (i.e. in Hildanus, op. cit., notes 9 and 11 above) no doubt reflects the common practice of the time of publishing whatever was available.

¹⁴ John Steer, *Hildanus [sic] G F, His experiments in chyrurgerie, concerning combustions or burnings, made with gunpowder, iron shot, hot water, lightning, or any fiery matter whatsoever. In which is excellently described the differences, signs, pronostications and cures, of all accidents and burning themselves. Very necessary and useful for all*

Gentlemen, and Soldiers as well as of the Trayned Bands, as others; especially upon sudden occasions. Translated out of the Latine by John Steer, chyrurgeon, London, Bernard Alsop, 1643.

¹⁵ *Ibid.*, pp. 58–9.

¹⁶ Walter Hermann Ryff also wrote under the latinized name of Gualtherus Reyff. His dates of birth and death are uncertain, see Ralph H Major, *A history of medicine*, Springfield, Illinois, Charles C Thomas, 1954, vol. 1, p. 465. Fabry cites Ryff as a reference for mechanical devices. The book referred to is almost certainly Walter H Ryff, *Die gross chirurgen, oder vollkommene Wundartzney*, Frankfurt am Main, Christian Egenolff, 1545. However, we have found an almost identical device in Hans von Gersdorff, *Felbuch der Wundartzney* (a photographic reproduction of the edition of the 1517 Strasbourg edition), Weiler im Allgäu, Germany, Editiones Medicina Rara Ltd. Holzer Press, 1967, p. 35 (see Figure 1b).

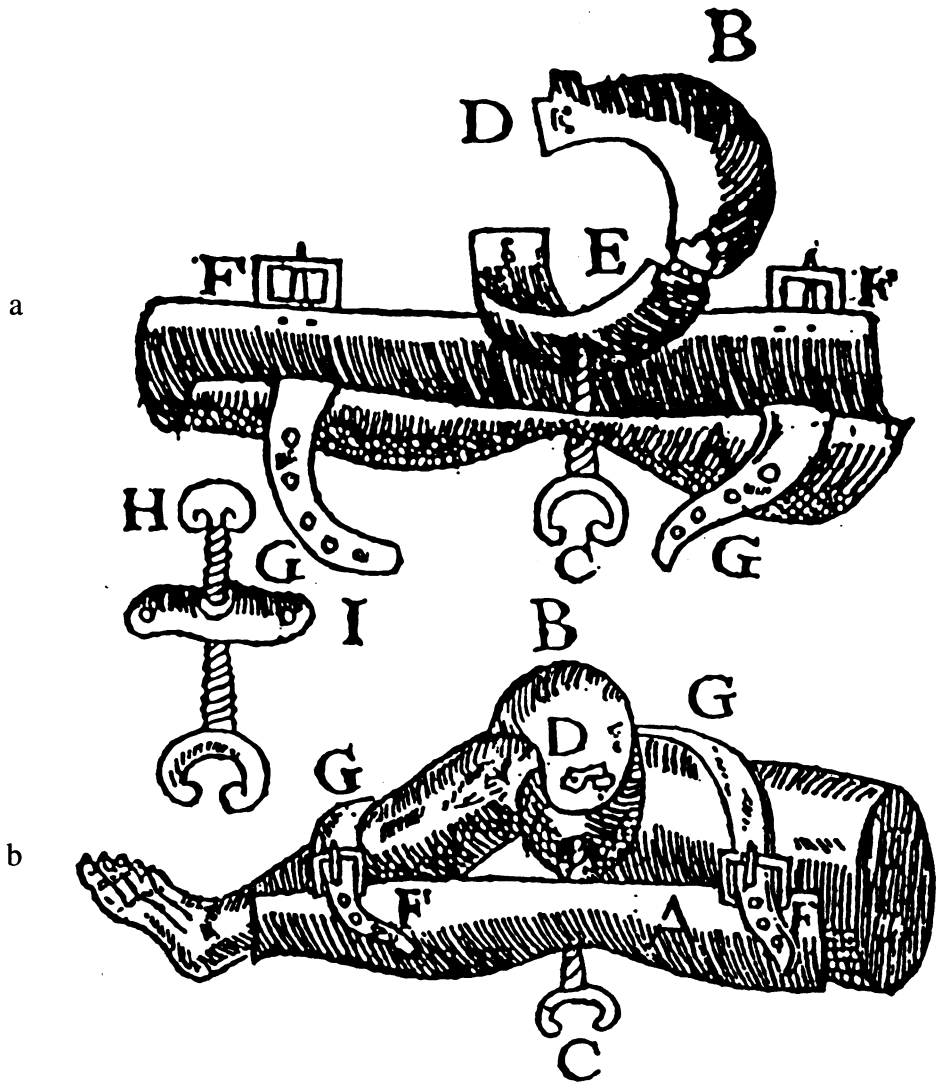


Figure 2: Fabry's own device used to correct contractures of arms and legs, as shown in the translation of John Steer. The letters a and b have been inserted to facilitate an understanding of Steer's text. (a) Device empty; (b) device in use.

(Reproduced by permission of the British Library, reference number E 130 (31).)

it, in Steer's original words, within our translation. We have elected to do this for the sake of completeness, as well as to show the contrast of styles.

While several authors have included the works of Fabry in texts on the history of medicine and surgery, most references to him relate, not to *De combustionibus*, but to his other treatises on, for example, gangrene, amputations of various types, lithotomy, gunshot wounds or more general matters such as post-operative complications.¹⁷

Although the text of *De combustionibus* has been largely ignored by medical historians, both woodcuts from Chapter 15 (see Figures 4 and 5) have been shown in a number of articles and texts on burns.¹⁸ Indeed, a complete page taken from Chapter 15 of *De combustionibus* has more recently been used as an illustration in a thorough review of the history of the treatment of burns.¹⁹ Surprisingly, however, the woodcut from Chapter 14 (see Figure 3), which shows Fabry's true surgical originality has, to our knowledge, never been previously reproduced. This simple device provides his ingenious solution to the difficult surgical problem of the correction of ugly scars. This is, in fact, only one of 200 instruments which were invented by this remarkable man for use in his own surgical practice.²⁰ These "instruments" included not only operative items but also splints, prostheses, hernial appliances, traction equipment and much more besides. It is little wonder that he later became known as "The Father of German Surgery".

Our paper therefore makes available a modern translation of part of a work which will be of interest to students of both surgical and pharmaceutical practice of the early seventeenth century.

Translation

Chapter XIV

Unightly scars and their removal

Following the cure of the burns, the main causes of unsightly scars are firstly, that the skin, flesh, veins etc. are contracted and hardened by the force of the fire and, secondly, that the innate moisture (which helps wounds and all ulcers to form scars) has been dried up by the heat and lost.

¹⁷ For gangrene and gunshot wounds see, Richard A Leonardo, *History of surgery*, New York, Froben, 1946, pp. 156–7; for amputations see, Daniel de Moulin, *A history of surgery, with emphasis on the Netherlands*, Dordrecht, Martinus Nijhoff, 1988, pp. 135, 214, and Owen H Wangenstein and Sarah D Wangenstein, *The rise of surgery: from empiric craft to scientific discipline*, Folkestone, William Dawson and Sons, 1978, pp. 22–3, 31; for lithotomy see, Wangenstein and Wangenstein, *ibid.*, p. 605, n. 73; and for post-operative complications see, Daniel de Moulin, 'Fabricius Hildanus (1560–1634) on postoperative complications', *Archivum chirurgicum Neerlandicum*, 1975, 27: 163–9.

¹⁸ Mogens Thomsen, 'Historical landmarks in the treatment of burns', *Br. J. plast. Surg.*, 1977, 30: 212–17, p. 214; W Peter Cockshott, 'The history of

the treatment of burns', *Surg. Gynecol. Obstet.*, 1956, 102: 116–24, p. 119; Anthony F Wallace, *The progress of plastic surgery. An introductory history*, Oxford, William A Meeuws, 1982, p. 3.

¹⁹ Mogens Thomsen, 'It all began with Aristotle—the history of the treatment of burns', *Burns (supplement)*, 1988, 14: S1–S54, p. S9.

²⁰ Jones, *op. cit.*, note 4 above, p. 196. Some photographs of these instruments can be seen in the catalogue of surgical instruments published by Carl Melcher (no author given), *Chirurgie Instrumente aus dem 16 Jahrhundert von dem berühmten Arzt Fabricius Hildanius [sic]*, Solingen-Merscheid, Carl Melcher, (no date given). A copy of this book can be found in the Thackray Medical Museum Library, Leeds, UK. Also see Samuel C Harvey, 'The history of haemostasis', *Ann. med. Hist.*, 1929, 1: 127–56, p. 142.

A dry and withered field produces twisted blackthorns, darnel and every kind of defective growth; but a good watered soil produces sound crops. In the same way the lack of natural warmth and moisture produces a nasty scar, as Hippocrates says "Biting cold hardens the skin, brings unendurable pain and blackens the ulcers".²¹ To prevent this, from start to finish in the treatment softening applications must be used. Regarding treatments, the hardness of the scars must be soothed and softened with the greases of bears,²² hen and capon, oil of lilies²³ and egg yolks²⁴ or with the following ointment.

Rx	Hen's grease	2 drachms
	Bear's grease	2 drachms
	Dark oil of thyme ²⁵	2 drachms
	Lily oil	2 drachms
	Egg yolks	2 drachms
	Myrrh oil	1 drachm
	Juice of earthworms ²⁶	0.5 drachm
	Mix, make an ointment and anoint the scar and surrounding area two or three times a day.	

Afterwards apply a thin sliver of lead²⁷ dipped in mercury. Before applying the above ointment the injured area must be washed in water, in which bran and some myrrh has been boiled. If the scars are so hard and raised as to require a stronger softener, first use the following decoction to foment²⁸ the area.²⁹

²¹ W H S Jones, *Hippocrates*, London, Heinemann, 1959, vol. 4, p. 163. The full text (in book 5, aphorism number 20) is "Cold makes sores to smart, hardens the skin, causes pain unattended with suppuration; it blackens, and causes feverish rigours, convulsions, tetanus".

²² See the account of the medicinal power of fats in Robert T Gunther, *The Greek herbal of Dioscorides*, New York, Hafner Publishing Co., 1959, pp. 114–15, (book 2, item 27). Despite the limitations of Gunther's translation, which is notoriously fallible, it nevertheless gives a good account of the sources and practical use of these fats. For a more analytical approach one should consult the recent and more accurate reappraisal of Dioscorides' work by John M Riddle, *Dioscorides on pharmacy and medicine*, Austin, University of Texas, 1985.

²³ A description of the complex process needed to manufacture this oil is given in Gunther, *ibid.*, pp. 35–6 (book 1, item 62). For a description on the further use of lily leaves and roots see John Scarborough, 'On medication for burns in classical antiquity', *Clin. Plast. Surg.*, 1983, 10: 603–10, pp. 605–6.

²⁴ See *ibid.*, p. 606.

²⁵ In the text it was "piscis thymali". The same spelling appeared in this formula in Steer's book, *op. cit.*, note 14 above, p. 55. We are, however, confident that this represents a typographical error and that "piscis" should be "picis", meaning pitch or tar. The use of the adjective "thymali" (meaning "of thyme")

is also of interest since "tar of thyme" does not, as far as we are aware, exist. However an "oil of thyme" was in contemporary use. This oil can have a darker (red) colour instead of the usual yellow, see Theophilus Redwood, *Gray's supplement to the pharmacopoeia*, 2nd edn., London, Longman, 1848, pp. 804–5. By using the word "picis" Fabry may well be alluding to this as a "dark oil of thyme".

²⁶ Earthworms were an ingredient of several contemporary formulations. One example is given in *Pharmacopoea Amstelredamensis senatus auctoritate munita (Facsimile of the first Amsterdam pharmacopoeia, 1636)*, introduced by D A Wittop Koning, Nieuwkoop, B De Graaf, 1961, p. 89 (of the facsimile).

²⁷ No doubt this must have acted in a similar way to the non-adherent dressings used today—in this case to avoid extension of granulation tissue between the fingers.

²⁸ Decoction is defined as "the act of boiling particularly applied to physical preparations either for diet, drinks or other uses". Fomentation is defined as "a liquid medicine for bathing any diseased part of the body". Both of these are from Thomas Dyche, *A new general English dictionary; particularly calculated for the use and improvement of such as are unacquainted with the learned languages*, 17th edn, London, Longman, 1794 (there are no page numbers in this book).

²⁹ Although modern surgeons recognize that the majority of scars tend to become softer with time, it

Wilhelm Fabry's Treatment of Burn Scars and Contractures

Rx	Marshmallow root (all parts)	1 ounce
	Briony root	1 ounce
	White lily root	1 ounce
	Chamomile flowers	1 handful
	Melilot flowers	1 handful
	Fenugreek seeds	0.5 ounce
	Linseed	0.5 ounce
	Boil in water with the feet and head of a castrated sheep and apply with sponges dipped in the decoction.	

Follow the fomentation with the previous ointment, apply ceratum Oesyphi of Philagrius³⁰ or frog and mercury ointment³¹ and apply a wax plaster until the scar is sufficiently softened so that it can be eased from the lead laminate.

Each time the scars are anointed the surgeon must try to stretch with both hands the hardened and wrinkled skin.

If the scar is so raised, wrinkled and hardened that very great unsightliness and deformity follow, it should be excised (if the patient agrees and the affected area allows this to be done) and taken off along a line as near to the base as possible. Then, before the wound re-contracts it will have to be kept open by using medicated lint³² which has been smeared with gluten, as shown in the following diagram [see *Figure 3*].

A is the wound following excision of the scar.

B.B.B.B. are lint pads smeared with gluten (formula below), two on each side of the wound with a space between each pad.

C.C.C.C. are the fastenings, use more or fewer depending on the size of the wound. In 4 or 5 hours, half a day at the most, the gluten will have set and the pads will be sticking firmly to the skin. At this stage the fastenings must be drawn together, contracting and drawing together the skin between the pads, but dilating the wound.³³

remains current practice to recommend the daily application of emollient creams to encourage this process, even though, to our knowledge, conclusive evidence to support the value of this has never been produced.

³⁰ "Ceratum Oesyphi ex Philagrii" was a complex wool fat based preparation which contained, amongst many other ingredients, ceratum oesyphi. Oesygium is simply wool fat whose use has been cited by Ovid, Herodotus, Pliny and Aristophanes. For a description of how ceratum oesyphi was made see Gunther, op. cit., note 22 above, pp. 112–13 (book 2, item 84). Philagrius was a Greek medical writer of the third century AD. This crude wool fat was obtained by scouring wool in hot water; the resultant emulsion was allowed to settle and the wool fat decanted from the solution. It is chemically neutral, does not become rancid and has a simple occlusive and emollient effect when applied to the skin. Such an effect would surely have helped to hydrate the area in which the scar had formed, aided further by the subsequent application of the wax plaster. A full formula for the preparation was given by Ambroise Paré in his collected works, see, *The works of that*

famous chirurgion Ambroise Parey. Translated out of Latine and compared with the French. By Th Johnson (and in part by George Baker), London, Th Coates and R Young, 1634, p. 1060.

³¹ Frog and mercury ointment, a contemporary formula (of 25 separate ingredients) is given in *Pharmacopoea Amstelredamensis*, op. cit., note 26 above, p. 111 (of the facsimile).

³² Lint is defined as "a soft material for dressing wounds, prepared by ravelling or scraping linen cloth", in J A H Murray, H Bradley, W A Craigie and C T Onions (eds), *Oxford English dictionary*, Oxford, Clarendon Press, 1933 (reprint 1961), vol. 6, p. 321.

³³ In resorting to surgery to excise unsightly and contracted scars, Fabry is following the accepted methods of today. His ingenious device would have prevented wound contraction and, therefore, promoted healing by secondary intention, with a consequently reduced risk of developing a later wound contracture. Today such an effect would generally be achieved more quickly by closing the resultant wound with skin grafts or flaps.

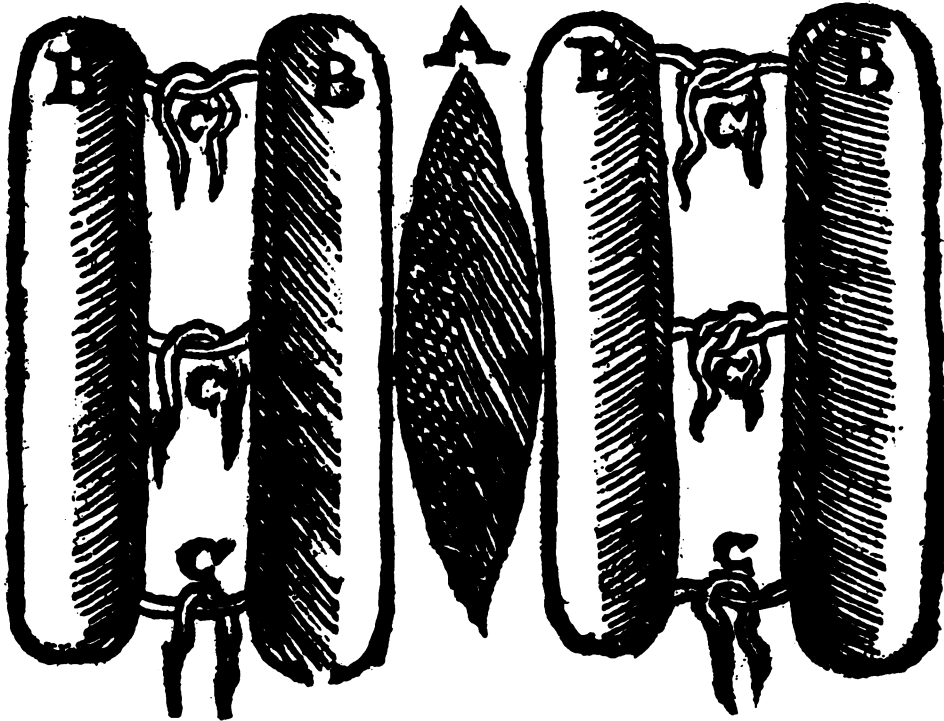


Figure 3: Arrangement of the adhesive lint pads (B) and their ties (C), enabling the site from which an unsightly scar had been excised (A) to be kept forcibly open during the subsequent process of wound repair. (Reproduced by permission of the Wellcome Institute Library, London, from G Fabricius Hildanus, *Opera observationum et curationum—chirurgicarum quae extant omnia*, Frankfurt am Main, Joannis Beyer, 1646, p. 931.)

Meanwhile the process of fleshing³⁴ and scarring of the wound is to be speeded up as quickly as possible. The pads should not be moved until the wound has been treated.

This is the prescription for glueing the pads.

Rx	Fine Flour ³⁵	2 drachms
	Mastic	2 drachms
	Red rose	2 drachms
	Dragon's blood	2 drachms
	Make into a very fine powder with the white of eggs and tragacanth mucilage mixed to the consistency of honey.	

³⁴ This term describes the process of granulation tissue formation. "Flesh" is defined under "proud flesh" as the "overgrowth of granulation which springs upon a wound", in Murray, Bradley, Craigie and Onions (eds), *op. cit.*, note 32 above, vol. 4, p. 314.

³⁵ In the text this was "farina volatilis", translating literally as "flying flour". Due to its very small

particle size this would make a very smooth glue. This flour may well have been collected from the walls of the flour mill as outlined in Zachary Cope, 'The treatment of wounds through the ages', *Med. Hist.*, 1958, 2: 163–74, p. 165.

This glue³⁶ should be applied after the suppuration of the wound has taken place. During this period there is pain and the edges of the wound are swollen, so the pain should not be increased by previous application of the glue. Once the suppuration has taken place, the wound should be washed with aqua vitae;³⁷ this makes pleasing scars.

Onto the area thin sheets of lead dipped in mercury can be applied. When the wound heals whitening agents may be applied onto the surface, such as white lily water, water from fabater flowers, egg extract, water distilled from egg shells and so on. These are efficacious in whitening scars.

Chapter XV

Retracted sinews and curvature of the joints consequent upon burns

In severe burns of the joints, the muscles/sinews sometimes retract and the joints curve inwards especially if insufficient care was taken at the outset and splints and other supports were not applied, as I advise in Chapter 11. Then fresh treatments must be used. First purge the body; depending on the nature of the predominant humour use an appropriate aggregative pill,³⁸ or electuary indum majus³⁹ and benedicta laxative.⁴⁰ If the patient is plethoric, cut a vein and draw off as much blood as the condition indicates. This is a job for a doctor.⁴¹

When the body is purged, and ready, the affected part must be softened up and made elastic by applying the following as a fomentation.

³⁶ That such a mixture of mastic, tragacanth and egg whites was able to resist the considerable force of wound contraction, and, furthermore, remain fixed to the skin for several days attests its highly adhesive properties. Nowadays several types of glue are used in the modern practice of surgery, ranging from "fibrin glue" to fully synthetic glues such as cyanoacrylate. These confer, in selected cases, the advantages over conventional suturing of speed and reduced pain for the patient.

³⁷ Although we could find no contemporary formula for aqua vitae, an English recipe of 100 years earlier can be found in Warren R Dawson (ed.), *A leechbook or a collection of medical recipes of the fifteenth century: the text of MS no. 136 of the Medical Society of London*, London, Macmillan, 1934. pp. 301–2. Aqua vitae would be bactericidal, as it contains approximately 70 per cent alcohol (but would not cause tissue destruction at this concentration).

³⁸ "A pill having the tendency to collect particulars into wholes". See Murray, Bradley, Craigie and Onions (eds), op. cit., note 32 above, vol. 1, p. 181.

³⁹ Electuary: "A medicinal composition made to the consistency of a conserve and taken as boluses", see Dyche, op. cit., note 28 above. A conserve is defined as "A medicinal or confectionery preparation of some part of a plant (as the flowers, leaves, roots, fruit) preserved with sugar". See Murray, Bradley,

Craigie and Onions (eds), op. cit., note 32 above, vol. 2, pp. 856–7. We are unable to trace the composition of the electuary "indum majus" in any of the contemporary reference sources, and wonder therefore whether it was one which Fabry himself devised.

⁴⁰ The full formula for Benedicta laxative, which consisted of 23 ingredients, may be found in *Pharmacopoea Amstelredamensis*, op. cit., note 26 above, p. 40 (of the facsimile). These range from spices such as nutmeg, mace, ginger and pepper, to laxatives such as turbith, scammony, hermodactylorum and galangae. Turbith, also known as "Montpellier turbith" (*Globularia aippum* [Linn.], from Southern Europe) is a powerful purgative. Scammony comes from the roots of *Convolvulus scammonia* [Linn.], and grows in Greece and the Levant. It is a drastic purgative due to its local irritant action. There is no doubt in our minds that such a sweet tasting and aromatic mixture would have produced an effective "reduction of the humours", as suggested in the text. A simplified formulation of only eight ingredients can, however, be found in John Quincy, *Pharmacopoeia officinalis et extemporanea; or, a compleat English dispensatory*, 3rd edn., London, Longman, 1721, p. 446 (part 3, section 6).

⁴¹ Doctors, as opposed to surgeons, had different duties and authorities. For example, surgeons such as Fabry were not licensed to prescribe medications to

Rx	Marshmallow (all parts)	2 ounces
	Briony root	2 ounces
	White lily root	2 ounces
	Mallow root	2 ounces
	Violet leaves	1 handful
	Chamomile flowers	1 handful
	Melilot flowers	1 handful
	Hypericum flowers	1 handful
	Ground pine flowers	1 handful
	Germander flowers	1 handful
	Fenugreek seeds	1 ounce
	Linseed	1 ounce
	Cook in a broth made from the feet and head of a wether [= a castrated ram] or bullock.	

Afterwards apply the following ointment to the whole limb.

Rx	Marshmallow ointment	2 ounces
	Human fat ⁴²	0.5 ounce
	Hen fat	0.5 ounce
	Goose fat	0.5 ounce
	Bear fat	0.5 ounce
	Earthworm juice	1 ounce
	Aqua vitae	0.5 ounce
	Mix, make an ointment.	

Then apply a plaster, Oesyphi Philagrii, or clover or melilot mucilage spread on soft leather. When the muscles and ligaments are sufficiently softened the straightening process begins. This can be aptly done without pain or danger with the proper instruments. If the damage is to the knee or elbow the most suitable instruments are those prescribed in the works of Gualtherus Reyff in his 'Illustrated Surgery'⁴³ and also in my works on 'Fluids and Cysts', Chapter 26.⁴⁴

be taken internally, see Robert Jütte, 'A seventeenth-century German barber-surgeon and his patients', *Med. Hist.*, 1989, 33: 184–98, p. 189.

⁴² Supplies of this ingredient may have been obtained from the local hangman, see Herman S Glasscheib, *The march of medicine* translated from *Das labyrinth der medicin* by Mervyn Savill, London, Macdonald, 1963, pp. 273, 281.

⁴³ Ryff, op. cit., note 16 above.

⁴⁴ The Latin title of this treatise was 'De ichore et meliceria'. It is found in Hildanus, op. cit., note 11 above, pp. 831–92. "Ichor" is a "thin, watery humour like serum, also the pus or matter that issues out of

ulcers". "Meliceria" is an "encysted tumour, consisting of matter like honey, which gathers without pain, and gives way to pressure but returns again". Both of these are defined in Dyche, op. cit., note 28 above. The full title of the treatise is 'De ichore et meliceria acri Celsi, sive hydrope articulorum: Tractatus novus. In quo de huius affectibus, origine, causis, signis, prognosticis, et curatione methodica, breviter et perspicue agitur, et empiricorum medicamenta examinantur'. The reference in the text is to Chapter 26, the title of which is 'De retractis nervis et incurvatis juncturis, post Ichorem et Meliceriam', *ibid.*, pp. 883–5.

Wilhelm Fabry's Treatment of Burn Scars and Contractures

[We now insert the section which appears in Steer's translation, but which is missing from our translation, as the reader of the third edition was referred elsewhere.⁴⁵]

Or else this following Instrument of our invention [see Figures 2a and 2b] which you may prepare with a little trouble, and it may serve as well to the Elbow as the Knee,

AA notifieth a little Casket made of wood, as well in the first figure [see Figure 2a] as in the second [see Figure 2b].

BB is an Iron plate made in the fashion of a Ring being of such breadth, that it will compasse the whole knee; but that in the first figure is open, and the other is shut and compasseth the knee, but that it may the better be fitted, it is necessary that part which belongeth to the rowndell of the knee be made hollow.

CC skeweth a skrew, by whose benefit the Ring is drawne downwards, or when need requires, is lifted upwards.

DDD As well in the first as in the second Figure, in one part it noteth a haspe, and in the other part it sheweth holes, by whose benefit the ring is made straight, or flake, according as need requireth.

E Noteth henges; in the first Figure with the which the rings opened and shut; therefore the ring being opened, and the legge being placed in the Casket, ye shall fit the ring about the knee, and defend it with pleagets and linnen clothes, then haspe it close with those haspes and holes which are noted with DDD. Furthermore, it hath two Buckels noted thus FFFF, and two thongs signified with GGGG by whose benefit the legge is bound in the Casket; therfore the skrew being turned fro the right hand towards the left, the ring and the knee are drawn towards the Casket, and the legge may be Extended as much as the Chirurgion shall see fitting: Furthermore, that the skrew may easily turne about in the ring, it is necessary, that it have a knobe which is noted with H.

I is an iron plate which is annexed to the Casket, between the two Buckels, that thereby the skrew may the more easily be turned about.

[We now return to our translation.]

Finger burns require a careful, skilled surgeon to consider the most suitable instruments to be used in the particular case. Using a sequence of medications and instruments I restored all the fingers of a right hand, except the thumb, which in a fire had been retracted backwards and joined together. I have already referred to this case,⁴⁶ nevertheless I repeat briefly the circumstances as a reminder to the reader before giving my treatment of the case.

In 1596 Isaac Gotteran of Perroy took me to Lausanne to see his son Michael who was then fourteen months old. As a six month old boy he fell with his right hand into burning coals. Here the index, middle, ring and little fingers⁴⁷ together with the outside part of the

⁴⁵ Since this section is found within 'De ichore et meliceria' in Hildanus, op. cit., note 11 above, pp. 831–92, it explains why Fabry did not include details of this device (figures 2a and 2b) in the third edition of *De combustionibus* (i.e. as it appears elsewhere in his collective works, of which this third edition also formed a part).

⁴⁶ This was reported as Observation 83, in his first *Centuria* under the short title of 'Digiti omnes dextra manus, pollice excepto, ex combustione in externam

manus partem retracti, ibique conglutinati, restituti'. This may be read in Hildanus, op. cit., note 11 above, p. 60.

⁴⁷ Even today there is no standard way of referring to individual digits, and this is often a source of confusion in the surgical literature. The Latin words, as used by Fabry, would provide an elegant solution to this problem. The earliest usage of some of the terms used in current everyday English language are: "little finger" (auricularis)—

metacarpus were so badly burnt that the tips of these fingers dropped off at the first joint. Because the father had obtained unskilled treatment all the fingers, except the thumb, together with the skin of the metacarpus had become joined together into a ball. See the following diagram [Figure 4].

Seven months later after the treatment had been abandoned I took over the case. I purged the body with manna and proceeded as follows.

First I used this softening decoction and ointment for several days.

Rx	Marshmallow root (all parts)	1 ounce
	Briony root	1 ounce
	White lily root	1 ounce
	Chamomile flowers	1 handful
	Melilot flowers	1 handful
	Germander flowers,	1 handful
	Fenugreek seeds	1 ounce
	Linseed	1 ounce

Cook in a broth made from the feet and head of a wether or bullock.

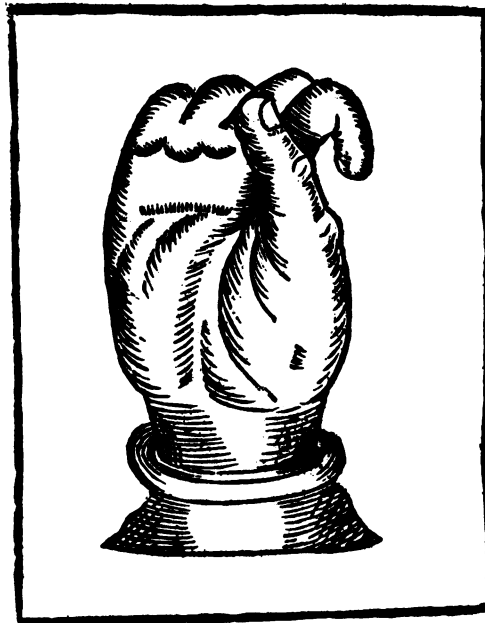


Figure 4: Woodcut showing the marked dorsal hyperextension of the fingers suffered by Michael Gotteran following a domestic burn injury, prior to the surgical intervention of Fabry. (Reproduced by permission of the Wellcome Institute Library, London, from G Fabricius Hildanus, *Opera observationum et curationum—chirurgicarum quae extant omnia*, Frankfurt am Main, Joannis Beyer, 1646, p. 932.)

circa 1172; “forefinger” (index)—circa 1266; and, “third finger” (medius)—circa 1266. These are detailed in Ronald E Latham, *Revised mediaeval*

Latin word-list from British and Irish sources, London, Oxford University Press, 1965, p. 146.

Wilhelm Fabry's Treatment of Burn Scars and Contractures

Afterwards I applied the following ointment to the hand and arm.

Rx	Marshmallow ointment	1 ounce
	Human fat	2 drachms
	Hen fat	2 drachms
	Goose fat	2 drachms
	Bear fat,	2 drachms
	Earthworm juice,	0.5 drachm
	Mix and make an ointment.	

Then I enclosed the hand in a plaster of mucilages. These sufficiently softened the muscles and the callousness of the wrinkled skin of the metacarpus and fingers. Next with a sharp knife I cut away the hardened skin between the fingers and metacarpus. Then I separated the fingers. Then I sprinkled on them my powder for checking bleeding and applied egg white mixed with rose and plantain waters and rose oil. I also applied a digestive ointment⁴⁸ to the carpus and anointed the whole arm with rose oil, myrrh oil and earthworm oil.

On the day after applying the digestive ointment, a bandage was wrapped around the incisions and arm and the following oil applied.

Rx	Turpentine lotion, in rose & plantain water	1 ounce
	Rose oil	2 drachm
	Egg yolk	2 drachm
	Crocus mixed with one egg yolk.	0.5 scruple

On the fifth day I fitted the following appliance made from wood [*see Figure 5*] and began slowly to bring the fingers back to their natural position.

A. is the splint and is of three finger widths and long enough to reach from the wrist almost to the elbow.

B. is a round stick, of a thumb's thickness, firmly attached to the splint.

In the middle of this stick are four round wooden pegs (labelled C.C.C.C.)

The splint has two metal buckles D.D. and two straps labelled E.E. These keep it in place on the arm. All of this can be understood from the figure.

I fastened the splint padded inside with lint and cotton wadding. I put finger stalls on the ends of the fingers. These were made of soft leather. Then with string, which I had fastened on the volar aspect I drew the fingers to their proper position and fastened them to the pegs (C.C.C.C.). Each day I drew them inwards a little bit more each time. To further assist the care, as often as I did the traction I covered the arm and hand with the above ointment.

⁴⁸ A digestive ointment is a preparation "promoting suppuration in a wound or ulcer", see Murray, Bradley, Craigie and Onions (eds), op. cit., note 32 above, vol. 3, p. 351. The source of this O.E.D. reference is in fact John Steer's translation of *De combustionibus*, op. cit., note 14 above, p. 62: "I

applied the following digestive with soft pledget upon the incision". These "digestives" were highly variable in composition since in the collective works of Fabry at least 5 formulae can be found, see Hildanus, op. cit., note 11 above, pp. 10, 35, 150, 156, 164.

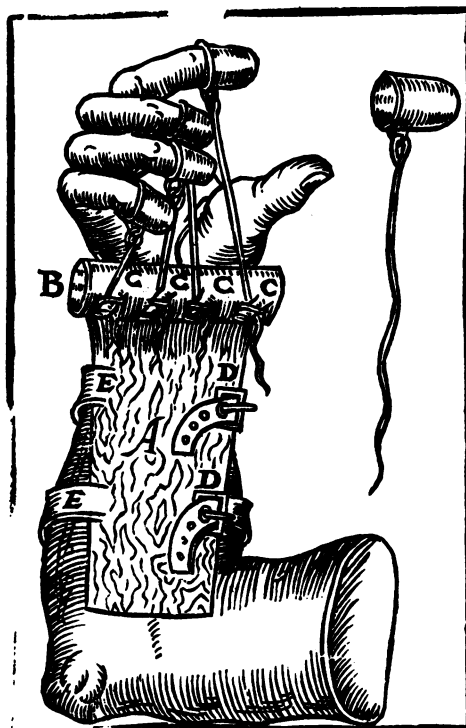


Figure 5: Traction device invented by Fabry incorporating an adjustable progressive traction mechanism to facilitate the restoration of the fingers of the injured hand shown in Figure 4. (Reproduced by permission of the Wellcome Institute Library, London, from G Fabricius Hildanus, *Opera observationum et curationum—chirurgicarum quae extant omnia*, Frankfurt am Main, Joannis Beyer, 1646, p. 933.)

Finally, to prevent the fingers from joining together again I put thin slivers of lead between them. By these means the fingers were slowly brought back to their natural place. Meanwhile I closed up the wounds and assisted the scarring process with medications; I used not only those drying applications but also those which have much ability to soften. By divine grace⁴⁹ the hand was restored to health.⁵⁰

⁴⁹ Fabry was a devoted Protestant and some measure of his devotion to this religion is best seen in his daily prayer, as translated by Jones, *op. cit.*, note 4 above, pp. 206–7.

⁵⁰ A case such as this would pose a considerable challenge even today. It would require a radical excision of the contractures and reconstruction using full thickness skin grafts, or even flaps, followed by an intensive regimen of splintage and physiotherapy. Even so, at best one could expect only a partial

return of function. Fabry's methods do therefore closely parallel those of today. Such methods have a greater chance of success in the young, and this would have been an important factor in "restoring the hand to health", which, in this context, we must assume means returning some useful function to the child's hand. It is interesting, however, to note that the illustrations appear to show the hand of an adult (see Figures 4 and 5).