

1525), surgeon to Pope Julius II, whose surgical compilations formed a standard text in the 16th century. The work is in two sections; the *Copiosa*, first published in 1514 and the *Compendiosa*, first published in 1517. After 1517 most editions of Vigo - and there were many - contained both the *Copiosa* and the *Compendiosa*; the latter is a much more summary treatment of the material. The combined work was translated from Latin into French by Nicolas Godin in 1525 and it is to this translation that Paré refers in the passage on p358 of the first edition of his *Oeuvres*.

Vigo discusses gunshot wounds in both the *Copiosa* and the *Compendiosa*. In the former he describes his reasons for believing that gunshot wounds are poisoned by the effects of the gunpowder and so present particular difficulties in treatment, and in the latter he summarizes their treatment in much less detail. It is to this latter passage, in [the *Compendiosa*](#), that Paré refers when he quotes Vigo's instructions that gunshot wounds must be cauterized with hot oil to prevent the patient being poisoned.

Interestingly, the remedy that Paré used when he ran out of oil, and which proved so much less damaging, is one of those that Vigo recommends for use after the gunshot wound has been cauterized. He gives much more detailed instructions for the management of these wounds, including the recipe for this salve, in his *Copiosa*, book III, chapter III, than there are in the *Compendiosa*.

Paré's observation that avoiding cauterization of gunshot wounds is not only better because it greatly reduces the patients' suffering, but is also less damaging, is striking enough in itself; but, in the context of its time, the use he made of his observation is even more remarkable and it is no coincidence that it was his teaching on this subject that was the foundation of his reputation and his career. For a young surgeon with no formal qualifications and not even registered as one of the least prestigious of the medical practitioners, the barbour-surgeons, to dare to publish his experience when it flatly contradicted the established academic authority on the subject must have required not only remarkable self-confidence but a good deal of courage. It is not difficult to imagine that most young men in his position who ran out of cauterizing oil would have been greatly relieved that their patients were not harmed - as indeed Paré tells us he was - but would have kept quiet about it. Indeed, we do not know that some anonymous surgeon may not have done exactly that before Paré. Paré's large measure of common sense, acute observation, compassion and the courage and confidence to be persuaded by his own observations of the errors of authority and of popular belief, shine out from his writings and were not disregarded in his own time. From his humble beginnings he became surgeon-in-chief to three kings of France and the most famous surgeon of his generation.

Paré published his first account of his discovery in 1545 - encouraged, as he says, by Sylvius (of whom more below). This first work on gunshot wounds was followed in 1552⁵ by a much enlarged work on the same topic and the new method of treating gunshot wounds was rapidly adopted across Europe. But Paré wrote in French and so his written works were inaccessible to many surgeons of other countries. In his dedication, to the royal physician Miron, of the first Latin translation of Paré's collected works, the *Opera* of 1582, his friend and former pupil Jacques Guillemeau, a fine classicist, cites the desire of foreign surgeons for a Latin version of Paré's works as one of the principal reasons for the publication of the translation. One may feel somewhat sceptical about whether this was really the principal reason for the translation - there is no doubt that Paré was anxious to enhance his reputation as an academic as well as a practical surgeon - but there is also no reason to doubt the veracity of Guillemeau's brief and charming tale.

Guillemeau, like his master, had followed the armies across Europe where he says⁶:-

'..... I carefully took note how those whom I met in the hospitals, Italian, German and Spanish surgeons distinguished both by their reputation and their works, went about their treatment. And I saw that they all followed only Paré's example. Those who knew no French had some pieces from his works, collected with much care by those who were skilled in Latin, that they carried with them as their viaticum.'

It is no exaggeration to say that Paré's discovery and his publication of it revolutionised the treatment of gunshot wounds in 16th century Europe.

Trial of treatment of burns with onions

To some of his accounts of the discovery that gunshot wounds do not need to be cauterized, Paré adds a description of how he tried and tested a folk-remedy for the treatment of burns. The second passage shown

here from the [1575 Oeuvres](#), and the corresponding translation, describes this 'trial' also carried out in northern Italy before the end of 1538 when Paré returned to Paris. In the *Oeuvres* Paré describes how, when he returned to Paris after the death of his master, de Montejan, and the news of his new treatment of gunshot wounds began to spread, he was invited to dine with Sylvius and tell him about his discoveries. Jacques Dubois (1478-1555), latinized as Sylvius, a hot-headed Picard, was a well-known and influential academic physician, humanist and teacher of anatomy. He was a staunch Galenist and an active protagonist of Galen's anatomy who strongly disapproved of his former pupil Vesalius's criticisms of Galen in his new anatomical works. For this, history has not treated him very kindly. However, anatomy owes Sylvius a considerable debt for his innovations in anatomical nomenclature. Le Paulmier (*op. cit.* note 3; p 21) says that Sylvius appears to have been Paré's master and had employed him to carry out blood-letting – a task which, as a physician, Sylvius would have delegated. Paré rehearses to Sylvius his arguments about why gunpowder does not poison gunshot wounds and goes on from this to discuss burns caused by gunpowder; this leads him to the story of the onion treatment.

The striking feature of the account is the comparison between the effects of onions and those of other treatments. In the first case, of the scullion, we are told only that in the places where the onion paste was not used there were blisters, but there were none where it had been applied. One supposes that this opportunity for comparison of treated and untreated areas probably arose as a chance effect of how the onion paste was applied. But in the second case, of the soldier whose powder flask had gone on fire, Paré records that he quite intentionally treated one side of the burnt face with onions and the other with 'the usual remedies' and that there was a very marked difference between their effects. This intentional use in 1537 or 1538 (see [Appendix for discussion of the date](#)) of direct comparison between two treatments applied in closely comparable conditions is one of the earliest accounts of controlled direct comparison in a trial of treatment - for all that it was apparently made in only one patient. Although he says no more about the onion treatment in the *Oeuvres*, Paré had, it seems, tested the remedy on more burned patients. In his original little book on gunshot wounds of 1545, Sigerist⁷ points out that Paré used onions to treat a number of soldiers burnt by a train of gunpowder. I have not been able to examine the 1545 edition but the second edition, of 1552, contains the following account which accords exactly with Sigerist's comments (he does not give a detailed translation). Here is a translation of Paré's account from the 1552 edition, p 45:

In the first place, I have seen by my own observations that the said onions have achieved marvels, particularly when I dressed several soldiers in Piedmont who had been burned by a train of gunpowder that the enemy had set during the assault on the castle of Villane. And I can assure you that when I was able to apply the onions in the manner aforesaid there arose no blisters nor pustules as there did in the other [patients] in whom the said remedy was not used.

But in this earlier account the stories of the scullion and the soldier with the exploding flask do not appear. Presumably the treatment with onions at the siege followed the observations on the scullion since the latter passage makes it clear that Paré had not used onions before and was told of the treatment by an old woman when he went to get the usual 'cooling remedies' to treat the boy.

Paré never seems to have collected all his observations in a single account. To discover that he had made comparisons of the effectiveness of onion paste both in two groups of patients and on the two sides of a burn in a single patient we have to collate the information from his early and his later accounts.

It is perhaps tempting to conclude that, in what Paré probably considered to be the definitive publication of his works - we know that he spared no pains or expense on the production of the 1575 *Oeuvres* - he included only what he felt was the 'best' evidence of the efficacy of the onion paste, that of direct comparison with older remedies, on the same burn in the same patient. Though this conclusion would sit well enough with what we know of Paré's fondness for, and reliance on, his own direct observations to guide his practice and teaching, it is also true that he is not inclined to spare his reader multiple examples of his experience. In any case, wishing opinions on a sixteenth century writer about what type of evidence he might have thought 'best' is quite unjustifiable.

Treatment of burns with onions was taken up and recommended⁸ by others; for example Joubert⁹, in his book on the treatment of arquebus wounds, says:

But nothing is as good as raw onion pounded with a little salt and applied, or a cloth soaked with the liquid expressed from it. It is a remarkable treatment used before there is any blistering, provided the burn is not near the eyes where it would be very painful: otherwise, and in other places, it is not

[painful].

The English surgeons Clowes¹⁰ and Wiseman¹¹ also recommended the onion treatment in 1591 and 1596 and in 1676 respectively. Much more recently, in 1944, Sigerist again drew attention to Paré's discovery; he discussed the use of onions by Clowes, Wiseman and others - though not Joubert - and suggested, on the basis of Russian observations in the Second World War, that it would be worth examining whether substances in onion juice have a beneficial effect on the healing of burns (reference in Note 7).

However, as far as I have been able to ascertain, none of the later authors refers in any way to testing of the efficacy of onion treatment or to comparison with other treatments for burns. In making these comparisons and basing his recommendation on the outcome Paré is unique.

Appendix

The dates of Paré's observations on the treatment of gunshot wounds and trials of a new method of treating burns.

In his *Oeuvres* of 1575 Paré describes how, after forcing the Pass of Suse in October 1537, the French army besieged and took the castle of Villane to avoid leaving a substantial force in its rear as it proceeded to Turin. The account of the observations on gunshot wounds follows immediately and the implication is that these events also took place during or immediately after the siege. Since Martin's¹² account of the campaign makes clear that Turin was taken, with its surrounding hinterland, soon after the forcing of the pass it would appear that the discovery that cauterization of gunshot wounds was not only unnecessary but was also harmful was made before the end of 1537; this is made even more likely since at the time the French New Year began on 25th March; it returned to its ancient date of 1st January in 1564. Thus 1537 would have ended in the March following the forcing of the pass.

The account of the discovery and trials of the effectiveness of onion paste for the treatment of burns, particularly those from gunpowder, follows a little later in the chapter in the 1575 *Oeuvres* and, if only this source were considered, it would appear to postdate the observations on gunshot wounds by some months.

However, in his earlier accounts of the discoveries, in 1545 and 1552, Paré describes his use of the onion paste at the siege of Villane to treat several men burned by a gunpowder train. Since it is also quite clear that his first use of this remedy was on de Montejan's kitchen boy and was at the suggestion of an old woman, this first use must antedate the siege of Villane¹³ and so must be close in time to the observations on gunshot wounds; it may even have preceded them.

At Villane he also compared the effect of the onions to that of other treatments and noted the absence of blisters when the onion paste was used; several men were treated with each method.

The timing of the observation on the man burnt by the exploding flask, when Paré treated half the face with onions and compared it to the other side treated with some other (unspecified) remedy, cannot be tied down precisely. Paré does not describe it in his earlier accounts and, in the 1575 *Oeuvres* says, after the account of the kitchen boy's treatment, that he treated the man whose flask exploded 'Some time later'. However, de Montejan was still alive so the episode took place before late 1538. We cannot tell whether it occurred before or after the treatment at Villane; if it was after, one might speculate that, having seen the benefit of the use of onion paste compared to other treatments, each treatment used on several men, Paré decided to use the burnt face to provide a comparison of a different kind, of the two treatments on the same burn in the same patient. More probably, he just made use on each occasion of what the situation offered.

References

1. René de Montejan, seigneur de Montejan. Appointed governor of Piedmont in December 1537 and Marshall of France in February 1538, he died towards the end of the same year. (Le Paulmier, C.-S. 1884 *Ambroise Paré d'après de nouveaux documents découverts aux Archives Nationales et des papiers de famille / par le docteur Le Paulmier.*, Paris: Charavay Frères. p. 20 note 1.)

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2. The date should be 1537. Turner, quoting Martin (see below) as source, points out that the pass of Suse was forced by the French in October 1537. (Turner, E., Ambroise Paré (1510 - 1590). *Gazette hebdomadaire de médecine et de chirurgie (2e Série)*, 1879. **16** (26): p. 408.)

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3. Martin, H. 1857 *Histoire de France depuis les temps les plus reculés jusqu'en 1789*. 4th edition. Vol VIII. Paris, Furne. p 248, for the year 1537.

Here is a translation of the relevant passage:

Du Guât had tried to block the passage of the French; he had surrounded Pignerol and sent six thousand men to Suse; but, during October, Montmorency forced the pass of Suse and spread out into the plains of Piedmont. This feat of arms was much acclaimed; the pass of Suse had been believed to be impregnable. The incompetence of the enemy general, Caesar of Naples, who had neglected to occupy the almost inaccessible rocks above the defile, delivered the victory to Montmorency. Basque arquebusiers, marvellously agile, scrambled up on to these rocks and poured down on the enemy a hail of bullets, taking them in the flank while Montmorency attacked from in front. Turin and Pignerol were relieved at the same time most of the places between the Po and the Tanaro surrendered to the French.

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4. *Hackbut* and *arquebus*. In the 16th century these names were used more or less interchangeably to describe a portable gun fired from a stand as opposed to a cannon or bombard. Paré uses both names indifferently.

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5. Paré, A. 1552 *La maniere de traicter les playes faictes par hacqueubutes, que par fleches: & les accidentz d'icelles, cōme fractures & caries des os, gangrene & mortification: avec les traictz des instrumentz necessaires pour leur curation. Et la methode de curer les combustions principalement faictes par la pouldre a canon*. Paris, Par Arnoul l'Angelié

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6. Paré, A. 1582 *Opera Ambrosii Parei, ... a docto viro plerisque locis recognita, et latinite donata, Jacobi Guillemeau, ... labore & diligentia*, Paris: Jacobum Du-Puys. sig. ã ij verso

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7. Sigerist, H. E. 1944 Ambroise Paré's onion treatment of burns. *Bull. Hist. Med.* **15**, 143-149.

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8. In the accounts which do not claim to be translations from Paré, it is perhaps possible that a folk remedy was the source rather than Paré's published observation. But where the accounts accompany denials that gunshot wounds are poisoned it seems probable that the onion treatment as well as the treatment of gunshot without cauterization derives from Paré.

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9. Joubert, L. 1574 *Traitté des arcbusades, contenant la vraye essence du mal, et la propre curation, par certaines et méthodiques indications, avec l'explication de divers problèmes touchant cette matière / par Laurens Joubert, ...* Lyon: Jean de Tournes. p 208.

Laurent Joubert (1529-1582) was a distinguished physician and, for a time, Chancellor of the Medical Faculty of Montpellier - the oldest in France - and a controversial figure among physicians because of his publication of medical material in French thus making it accessible to those of the literate general population who lacked Latin. For the benefit of surgeons, many of whom had no Latin, he also published a translation from the Latin of the *Chirurgia* of the famous 14th century French surgeon, Gui de Chauliac, also of Montpellier, and a commentary on his writings. Joubert's text does not mention Paré's observations.

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10. Clowes, 1591: Though Clowes does not attribute the onion remedy to Paré, a marginal note on the same page refers to '*Am Parre his unguentum pro igne*' so there is no doubt that Clowes had read Paré.

Clowes, 1596: The same remedy, onion juice and linseed oil, is given on p 5. The next page has a list of remedies by authorities, including Paré, who are identified in marginal notes.

It is difficult not to conclude that Clowes took the onion treatment from Paré's published work.

Clowes, W. & Almenar, J. d. 1591 *A prooued practise for all young chirurgians, concerning burnings with gunpowder, and woundes made with gunshot*, [London] : Printed by Thomas Orwyn, for Wydow Broome. p 4.

Clowes, W. 1596 *A profitable and necessarie booke of obseruations, for all those that are burned with the flame of gun powder, &c...* Imprinted at London : By Edm. Bollifant, for Thomas Dawson. p 6.

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11. Wiseman, R. 1676 *Severall chirurgicall treatises by Richard Wiseman ...* London : Printed by E. Flesher and J. Macock, for R. Royston ... and B. Tonk p 440.
12. see Commentary note 2 for reference.

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13. The defence of Villane by the Imperial troops, which Paré describes in some detail, appears to have been regarded in the 16th century as an example of illegitimate behaviour in war. The captain of the garrison and his lieutenant were hanged after the fall of the fortress as Paré describes (*Oeuvres*, 1575, pp 357-358):

The captain and ensign were taken alive but were soon hanged and strangled on the battlements of the city gate to make an example and frighten the Imperial soldiers so that they would not be so bold and foolhardy as to hold such a place against so great a host.

Michel de Montaigne used the events at Villane as one example of the fate that awaits those who obstinately defend an indefensible stronghold in his essay '*Stubborn and futile resistance is punished*' (*Essais*, Book 1 Ch 14. 1580 and later editions); Cotton, towards the end of the 17th century, translates the title by a paraphrase of the essay:

'That Men are justly punish'd for being obstinate in the Defence of a Fort that is not in reason to be defended'

Montaigne describes the events at Villane in phrases extraordinarily similar to those used by Paré and clearly regards such defence not as courageous and laudable but as reprehensible and contrary to the proper practice of war thus : '*... the custom that we follow during war of punishing by death those who persist in defending a place that by the rules of war cannot be held*'

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