Staphylagra, *Staphylocaustes*, Uvulectomy and Haemorhoidectomy : the Roman Instruments and Operations

It is almost always difficult to match surviving Roman surgical instruments, other than those of the simplest type, to the instruments named in the classical medical texts (see Milne, 1907 ; Künzl, 1983b and 1985 ; Bliquez, 1981 and 1985 ; Jackson, 1986 and 1990). Very many different knives, for example, are referred to in the texts. Often they are specified for a single operation, like the polypus knife, (e.g. Celsus, *De med.*, VII, 10. Soranus, *Gyn.*, IV, 11), the tonsil knife, (e.g. Paulus Aegineta, VI, 30), and the pterygium knife, (e.g. Paulus Aegineta, VI, 18 ; VI, 22. Aetius, II, iii, 60 ; II, iii, 74). Yet few of these specialised knives have been positively and convincingly identified amongst the remaining instruments (for a conspicuous exception see Künzl, 1983b). In the case of knives this is partly due to the perishable nature of their thin iron blades. But it is also due to the paucity or total lack of description of their appearance. For, just as a surgeon today knows his instruments by their names, so the medical writers of antiquity assumed a similar knowledge of their readers and felt under no obligation to describe the appearance of individual surgical tools. There is, therefore, a gap to be bridged between on the one side the surviving instruments – the archaeological evidence – and on the other side the names of instruments in the classical texts – the literary evidence.

Despite the deficiency in the description of the appearance of the instruments, there are, nevertheless, clues to be found in the description of their use or uses. This applies especially in cases where that use is similar to a modern function. Then the form of the recent instrument can give guidance as to the general appearance and requirements of its ancient counterpart. For example, there is little doubt about the identity of Roman catheters. The remaining examples are of a form which would have enabled the surgeon to carry out all the operations ascribed to the instrument in

the classical texts. Furthermore, they are closely similar to modern catheters (Jackson, 1986, p. 126-127, 147-151 ; Krug, 1985, p. 92-93 ; Bennion, 1979, p. 77-80).

The situation is more complicated when the operation is one seldom performed in recent times. There is then less scope for comparing modern and ancient instruments. Such is the case of uvulectomy, excision of the small fleshy appendage which hangs from the free edge of the soft palate. Today uvulectomy is a rare surgical procedure, yet the Greek and Roman writers, from Hippocrates onwards, made frequent reference to inflammation of the uvula arising from a variety of causes. Amputation, usually partial, was often recommended as the resolution to both chronic and acute conditions (e.g. Caelius Aurelianus, *On Acute Diseases*, III, 1, 6 ; III, 4, 32 ; Celsus, *De med.*, VII, 12, 3 ; Galen XIV, 785 K ; Oribasius, *Coll. med.*, XXIV, 10). However, the operation was not without danger, and treatment with medicaments was preferred by most of the ancient authorities. Thus, Caelius Aurelianus rejected uvula excision, and Galen also recommended treatment by drugs (Caelius Aurelianus, *On Acute Diseases*, III, 4, 32 ; Galen, *De ablatione columellae*). Celsus, Aetius and Paul all advocated cupping, purging and drug therapy in preference to surgery, which they envisaged as a last resort, and then only if the uvula was not in a severely inflamed state, when there would be a danger of haemorrhage (Celsus, *De med.*, VI, 14 ; VII, 12, 3 ; Aetius II, iv, 12 ; Paulus Aegineta, VI, 31).

Excision of the uvula is mentioned in several of the Hippocratic treatises (Adams, 1846, p. 300), and Praxagoras performed the operation in the later 4th century B.C. (Caelius Aurelianus, *On Acute Diseases*, III, 4, 32). Celsus (*De med.*, VII, 12, 3), who advocated partial amputation, described no specialised instruments, and his operation could have been performed with two of the most basic tools of the surgeon's instrumentarium, a pointed-jawed forceps and a small scalpel or knife. However, a uvula forceps – *staphylagra* – is referred to in the late Hippocratic treatise *De medico liber* (I, 63, 5) as one of the instruments required by a physician, and there are good descriptions of the use of the *staphylagra*, much later, in the books of Aetius (II, iv, 12) and Paul (VI, 31). Aetius says :

> « It is best and most expedient to remove it [the uvula] when choking threatens ... The sufferer must be placed in a well-lighted spot, and then his mouth shall be opened wide. Then, inserting a forceps and making traction on it, the uvula crusher (*staphylagra*) is fitted on about the middle of the uvula or a little below it and then it is pulled and twisted. By the torsion it becomes lifeless and, as it were, snared off ; it curls up, becomes livid and comes off without much effusion of blood. Wherefore it is well to wait some time and hold it till the patient can stand it no longer, and then cut it off – the cut being made close to the forceps but nearer the tip [of the uvula] than to it » (Trans. Møller-Christensen, 1938 ; Milne, 1907).

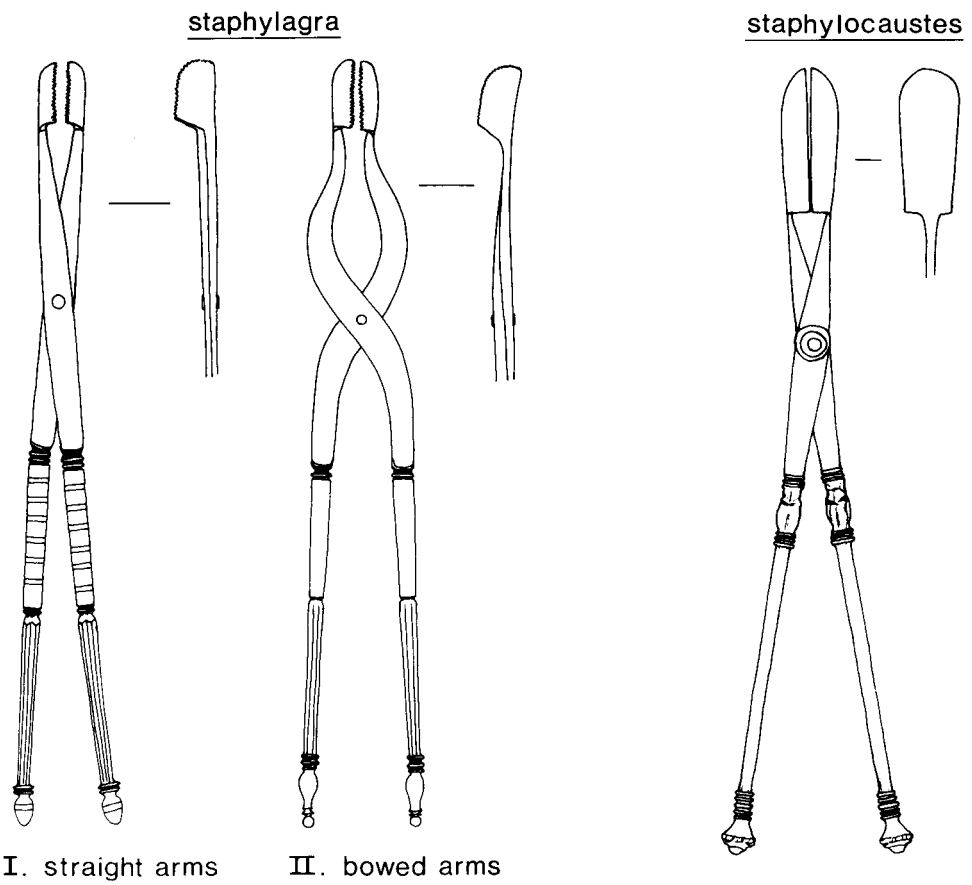


Fig. 1. Uvula forceps: typology.

As can be seen, instead of simply grasping the uvula with a forceps and cutting off the tip with a knife, as in the Celsian operation, the *staphylagra* was to be used in an intermediate step to crush the neck of the uvula, while with the other forceps the tip was twisted to render it lifeless prior to excision. This sounds nasty, as indeed it must have been, but the benefit was that it reduced the risk of haemorrhage. Nevertheless, for those who would not tolerate this operation there was an alternative instrument, named *staphylocaustes*, whose use Paul (VI, 31) describes very fully:

> « But since often, from the timidity of the patient, or the fear of hemorrhage, or the success attending the treatment by medicines, he declines the operation by instruments, we may rather consume it by means of a caustic medicine. Wherefore, taking the caustic used for burning the eyelids, or some such, we are to fill with it the hollows of the instrument called staphylocaustes, and directing the patient to gape wide, and getting the tongue pressed down with

> a tongue spatula, we open the instrument sufficiently and grasp with it as much of the uva as we cut off in the other. The medicine must neither be of too liquid a consistency, lest it run down from the uva improperly, and burn the adjoining parts (and, therefore, we direct the patient not to swallow during the whole operation of burning), nor very hard, that it may soon act upon the uva. And if from one application the extremity of the uva becomes black, this will be sufficient, but if not we must use it again. During the whole time of its action the patient must sit with his head bent forwards, in order that the saliva which is melted down with the portions of the medicine may flow from the mouth. The part becomes dead in one hour, and falls off about the third or fourth day » (Trans. Adams, 1846).

Milne (1907, p. 97) saw the similarity between the function of these instruments and the modern pile-crusher. Indeed, as Paul records (VI, 79), both *staphylagra* and *staphylocaustes* were also used to remove haemorrhoids :

> « Leonides has not recourse to the ligature, but having seized the hemorrhoids and held them for some time with the forceps used for operations on the uvula he cuts them off with a scalpel ... Others by filling the cavity of the instrument called staphylocaustes, with caustic medicines, have burnt hemmorrhoids like a scirrhous uvula » (Trans. Adams, 1846).

The use of these two instruments extended the range of operations that were performed to remove the uvula and haemorrhoids. They marked an improvement in technique, particularly for uvulectomy where difficulty of access prevented removal by ligature. The Roman patient and his surgeon had a choice of four operations for amputation of the uvula :

1. direct excision by knife ;
2. excision preceded by crushing with the *staphylagra* ;
3. cauterization with heated cauteries ;
4. cauterization with caustics held in the *staphylocaustes*.

For the removal of haemorrhoids at least five operations were possible :

1. direct excision ;
2. excision preceded by crushing with the *staphylagra* ;
3. cauterization using heated cauteries ;
4. cauterization with caustics applied with the *staphylocaustes* ;
5. ligation.

Milne (1907, p. 97-100) matched the ancient descriptions of the appearance and usage of the *staphylagra* and *staphylocaustes* to two characteristic types of Roman cross-legged forceps, one with tooth-edged hollow jaws, the other with smooth-edged hollow jaws (Fig. 1). There is no reason to doubt his interpretations, which are fully convincing. However, his further suggestion (Milne, 1907, p. 99) that the two types were sub-divided into long and short-handled varieties depending on whether they were intended for uvulectomy or haemorrhoidectomy, although a logical supposition, and one endorsed by

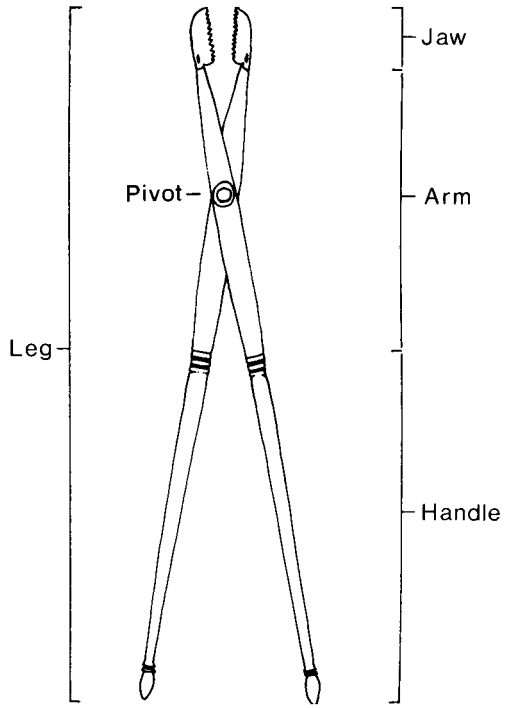


Fig. 2. Uvula forceps: terminology.

Møller-Christensen (1938, p. 139), is not borne out by a study of the surviving instruments. Milne found support for his theory in the *staphylocaustes* in Vienna (Fig. 5, no. 25) and the *staphylagra* in Naples, (Fig. 4, no. 13). Their handles are undeniably short, but in both cases this is due to breakage at the decorative mouldings. There are no other examples with short handles, and the short-handled variety must therefore be rejected as a myth.

Nineteen examples of the *staphylagra* and three examples of the *staphylocaustes* are included in the present catalogue. All are made of copper alloy (X-ray fluorescence analysis of nos. 11 and 12 (British Museum Research Laboratory Envelope 5969) has shown them to be typical Roman brasses), and all would have given the surgeon a firm enclosed grip of small structures or objects. The main features are:

1. long handles giving considerable reach to the jaws;
2. crossed arms, and a pivot closer to the jaws than the handle tips, the combination of which gave the instrument considerable leverage;
3. slender arms and jaws which gave access to relatively confined spaces;
4. accurately-opposed and close-fitting jaw rims which permitted a crushing or clamping action across the neck of small structures, tumours or growths;
5. capacious, hollow, half-moon shaped jaws to enclose something bulbous.

Although more fearsome than the smooth-jawed *staphylocaustes*, the toothed *staphylagra* must have been a successful and more versatile instrument. It is otherwise difficult to explain why it is so much more commonly found.

In size, form and decoration the examples of the *staphylagra* have a distinct unity of design. However, two types can be discerned according to whether their arms are straight or bowed (Fig. 1). The bowed variety is relatively uncommon with just three known examples. There is, perhaps, a functional explanation: the bowed arms would have made access to the uvula more difficult than with the straight-armed type. The bowed arm *staphylagra* may, therefore, have been intended for external haemorrhoid operations alone, while the straight-armed design would have permitted use in a wider range of operations.

Another unusual feature of six examples of the *staphylagra* (nos. 3, 5, 10, 12, 13, 14, Figs. 3 and 4), is a small hole in the corner of each jaw. Milne (1907, p. 98) believed this was to allow the tying together of the jaws to simplify prolonged clamping. However this is not an altogether satisfactory explanation. Firstly it would be impossible to employ in the operation on the uvula; secondly, it is difficult to explain why it should be such a rare feature; and thirdly, the simplest way to clamp the forceps closed was to put a loop across the handles, not the jaws, as was done, for example, on certain other types of Roman forceps (see e.g. Jackson and Leahy, 1990), including the hybrid *staphylagra* from Colchester (cat. no. 20; Pl. 2). The purpose of the jaw perforations therefore remains uncertain.

Examples of the *staphylagra* vary in length from 16.9 to 22.5 cm, with the majority in the range 19 to 20 cm (Table 1). The number of teeth on each jaw is most commonly 24 to 26, but there are extremes of 12 and 30. The jaw size is fairly constant at about 1.6 to 1.9 cm long and about 1 to 1.2 cm wide. Expressing the leverage in terms of the ratio of the handle to pivot and pivot to jaw (Fig. 2), it emerges that there was considerable variation, from 1.3:1 to 3.5:1, though most are about 2:1. These differing ratios probably have more to do with the need to operate the jaws in confined spaces than the need to provide powerful leverage. All would clearly have sufficed for the intended operations, and the slightly greater pressure required to operate those with lower ratios would have been negligible.

In most cases the level of craftsmanship in the manufacture of the instruments is of a very high order. The teeth usually interlock precisely and the outer surface of the jaws is usually exceptionally smooth. Decoration was kept away from the functional end of the instrument, being restricted to the handle zone (Table 2; Figs. 3-5). The mouldings differ slightly in their degree of elaboration and skill of application, while the handle finials

are normally in the form of stylised pine cones. There is a clear stylistic affinity between nos. 6 and 8 and between nos. 24 and 25 (Fig. 5). More striking still is the close similarity between nos. 10, 12 and 14 (Fig. 3). They have in common the single unit, rectangular-sectioned handle with simple mouldings of rather indifferent workmanship; they also include simple washers in their pivot assembly; and they all have jaw perforations (comprising three of the six known examples). It is possible that they are

TABLE 1. — UVULA FORCEPS. COMPARATIVE DIMENSIONS (CM.)

Cat. nos.	Provenance	Context Date	Length	Jaw Size	Teeth per jaw	Length handle	Length arm + jaw	Length handle to pivot	Length pivot to jaw	Ratio of handle/ pivot : pivot/jaw
STAPHYLAGRA, Type I										
1.	Caerwent	–	19.2	1.5x0.8	*c.*25	10.0	9.2	13.3	5.9	2.3 : 1
2.	Cyrene	–	?	?	?	?	?	?	?	2.1 : 1
3.	Ostia	–	22.5	1.9x1.2	29	13.1	9.4	16.7	5.8	2.9 : 1
4.	Paris	*c.* A.D. 275	19.0	1.9x1.2	*c.*25	9.5	9.5	13.4	5.6	2.4 : 1
5.	Rome	–	18.7	1.7x1.2	14	9.9	8.8	14.4	4.3	3.5 : 1
6.	Tartûs	–	broken	broken	–	9.0	–	12.5	–	–
7.	Trier	–	broken	1.8x1.1	24	broken	9.5	–	5.9	–
8.	Italy	–	19.6	1.6x1.1	*c.*24	9.5	10.1	13.1	6.5	2.0 : 1
9.	Unprovenanced	–	18.8	1.6x1.1	21	9.6	9.2	12.4	6.4	1.9 : 1
10.	Unprovenanced	–	20.2	1.9x1.1	26	11.0	9.2	15.3	4.9	3.1 : 1
11.	Unprovenanced	–	20.2	1.8x1.0	24	10.0	10.2	13.9	6.3	2.2 : 1
12.	Unprovenanced	–	18.7	1.6x1.2	19	9.4	9.3	13.7	5.0	2.7 : 1
13.	Unprovenanced	–	broken	1.8x1.1	*c.*15	broken	8.4	–	4.9	–
14.	Unprovenanced	–	20.2	1.8x1.2	20	10.6	9.6	14.6	5.6	2.6 : 1
15.	Unprovenanced	–	broken	broken	–	9.4	–	13.0	–	–
STAPHYLAGRA, Type II										
16.	Ancaster	–	16.9	2.1x1.3	12	9.4	7.5	9.4	7.5	1.3 : 1
17.	Augst	–	20.3	1.9x1.0	*c.*30	9.6	10.7	13.5	6.9	2.0 : 1
18.	Avenches	–	19.4	1.8x ?	*c.* 25	9.9	9.5	13.3	6.6	2.2 : 1
STAPHYLAGRA, Uncertain										
19.	Marcianopolis	*c.* A.D. 400	?	?	?	?	?	?	?	?
STAPHYLAGRA, Hybrids										
20.	Colchester	–	19.8	2.8x1.2	31	Sprung,		not	hinged	
21.	Italy	–	18.5	1.7x?	*c.*30	Sprung		not	hinged	
22.	Unprovenanced	–	21.1	2.6x1.1	22	9.9	11.2	15.1	6.0	2.5 : 1
23.	Colchester	–	21.9	1.6x0.8	5	4.9	17.0	11.9	10.0	1.2 : 1
STAPHYLOCAUSTES										
24.	Italy	–	21.0	4.0x1.8	–	10.2	10.8	13.7	7.3	1.9 : 1
25.	Unprovenanced	–	broken	3.3x?	–	broken	9.7	–	6.6	–
STAPHYLOCAUSTES, Uncertain										
26.	Marcianopolis	*c.* A.D. 400	?	?	?	?	?	?	?	?

products of the same smith or workshop. In only one instance – no. 11 (Fig. 4) – does the decoration include inlay, a rare variety which is currently undergoing analysis in the British Museum Research Laboratory (M.R. Cowell and P.T. Craddock). It comprises a series of inlaid bands composed of a copper-based metal with minor amounts of gold, silver and arsenic, and with an artificially induced black patina. According to recent research (P.T. Craddock, pers. comm.) this is almost certainly to be identified as 'Corinthian bronze' (see Craddock, 1982 and Craddock and Giumlia-Mair forthcoming). The body metal of the handles is brass so originally there would have been a striking black and gold colour contrast. Despite the comments of Lucian (*Adversus indoctum*, III, 29), who disapproved of showy instruments, the prospective Roman patient may have been impressed !

TABLE 2. – UVULA FORCEPS. HANDLE MORPHOLOGY (Figs. 3-5)

HANDLE FORM

1. Single unit. Rectangular, or chamfered rectangular cross-section.
   cat. nos. 10, 12, 14, 16.
2. Double unit. Round and/or octagonal cross-section.
   cat. nos. 4, 5, 6, 8, 9, 11, 15, 17, 22, 24.
3. Triple unit. Round and/or octagonal cross-section.
   cat. nos. 1, 2, 7, 18.

HANDLE DECORATION

A. Grip
   1. Multiple disc mouldings.
      cat. nos. 1, 2, 4, 7, 9, 10, 12, 14, 15, 17, 18.
   2. Baluster moulding.
      cat. nos. 5, 6, 8, 25.
   3. Acanthus moulding.
      cat. nos. 22, 24.
   4. Multiple disc and squat baluster mouldings.
      cat. nos. 3, 13.
   5. Inlaid bands.
      cat. no. 11.

B. Finial
   1. Elongated pine cone.
      cat. nos. 1, 2, 4, 5, 10, 12, 14, 18.
   2. Squat pine cone.
      cat. nos. 3, 6, 8, 9, 11, 15, 16.
   3. Baluster.
      cat. nos. 17, 20, 21, 23.
   4. Lion's head.
      cat. nos. 22, 24.

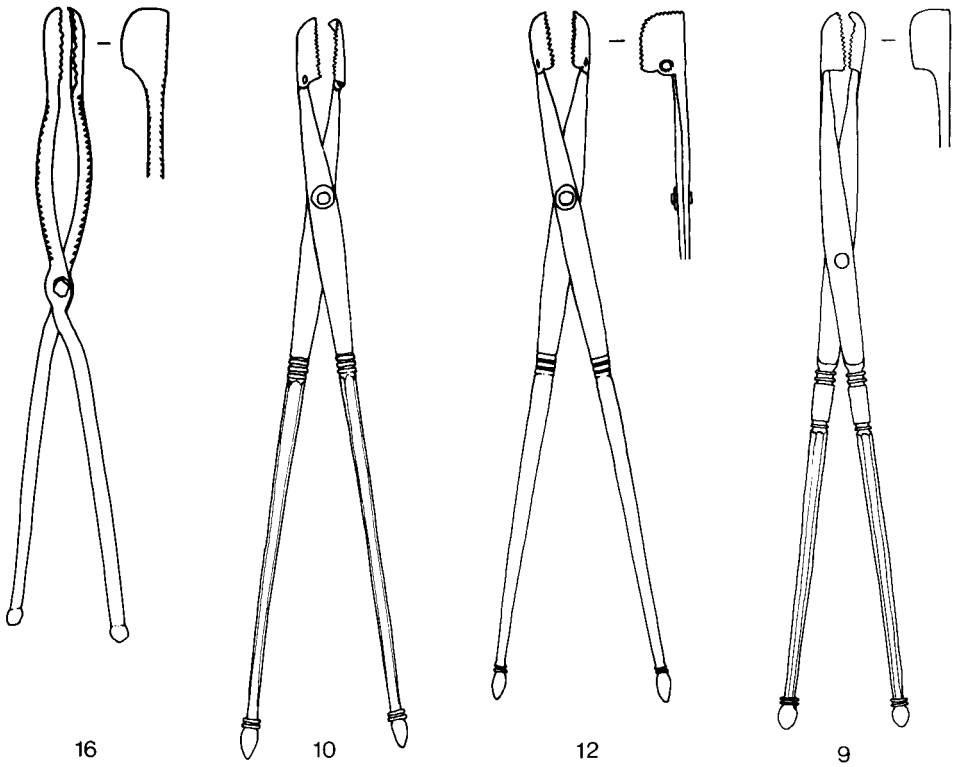


Fig. 3. Uvula forceps, arranged according to handle decoration. Cat. nos. 16, 10, 12, 9.

The number of known *staphylagra* and *staphylocaustes* is not great, and several are, sadly, unprovenanced. Nonetheless, with examples from Britannia to Syria and Moesia to Cyrenaica, it is clear that their use was widespread in the Roman empire. There is, unfortunately, pitifully little dating evidence with only one certain example, the *staphylagra* from Paris (no. 4), in a securely dated context, *c.* A.D. 275. However, the fine, moulded acanthus decoration of the *staphylocaustes* from Italy (no. 24. Fig. 5) is most easily paralleled on instruments dated within the period 1st to 3rd century A.D. (1st century A.D. : Pompeii, Vulpes, 1847, pl. IV, figs. I-III, vaginal speculum Pl. VI, figs. I-II, spoon and knife. 1st and 2nd century A.D. : Merida, Künzl, 1983, p. 102-103, fig. 81, vaginal speculum. Italy, Jackson, 1986, p. 124-125, fig. 2, 16, p. 140-143, double blunt hook. 2nd/3rd century A.D. : Nea Paphos, Michaelides, 1984, fig. 1, 20, double blunt hook. 3rd century A.D. : Aschersleben, Künzl, 1983, p. 100-101, fig. 80, sharp hook, forceps/elevator, bone lever), while the reported *staphylagra* from Marcianopolis comes from a destruction deposit dated *c.* A.D. 400. Sparse though the evidence is it gives a provisional minimum date range for the use of the instruments (if

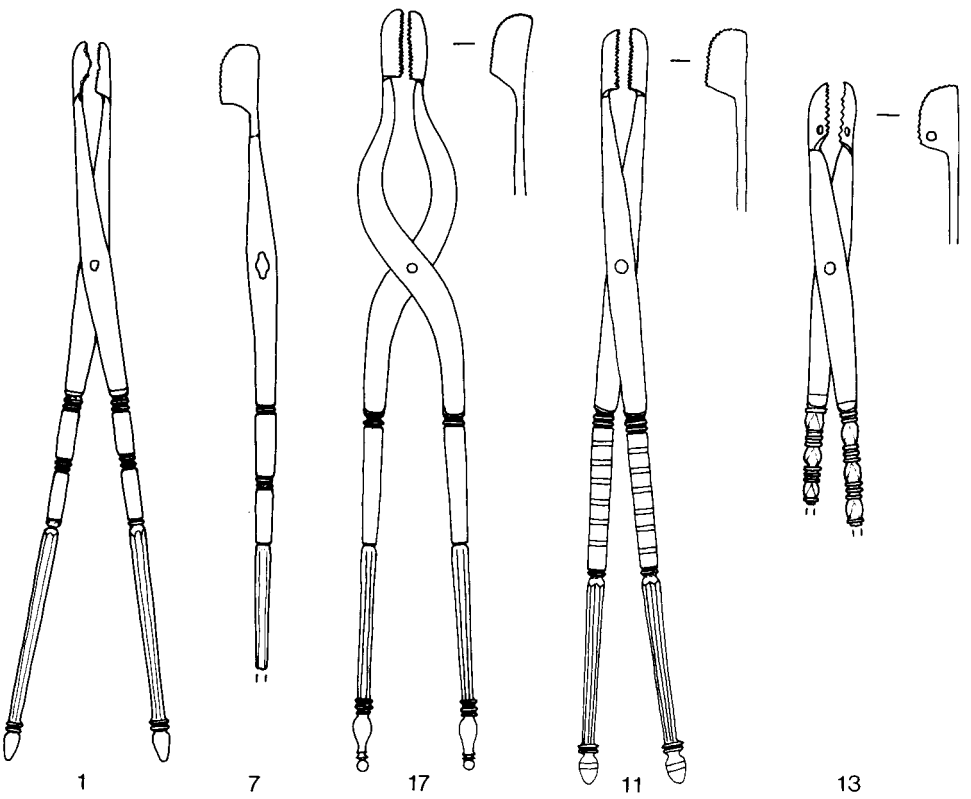


Fig. 4. Uvula forceps, arranged according to handle decoration. Cat. nos. 1, 7, 17, 11, 13.

not their manufacture) of 1st to 5th century A.D. This broadly parallels the chronology provided by the literary evidence, which begins with a mention of the *staphylagra* in a late Hippocratic treatise (*De medico liber* I, 63, 5 : probably 1st century B.C./1st century A.D.), is followed by a reference to Leonides' operation for haemorrhoidectomy using a *staphylagra* in the 2nd century A.D. (Paulus Aegineta, VI, 79) and ends with the best descriptions of the instruments, those of Aetius and Paul in the 6th and 7th centuries A.D. (Aetius, II, iv, 12 ; Paulus Aegineta, VI, 78 and VI, 79). The uvula forceps may not have passed into Arabic surgery, for, though Albucasis (II, 37) describes both partial excision and cauterisation of the uvula, he makes no mention of a specialised forceps for these operations (Spink and Lewis, 1973, p. 306-311). If the 1st to 2nd century A.D. date of the *staphylocaustes* no. 24 is correct it pre-dates by some five hundred years the written references to its use in Paul (Paulus Aegineta, VI, 31 and VI, 79). It is to be hoped that future discoveries of both *staphylagra* and *staphylocaustes* will further extend and sharpen their chronology.

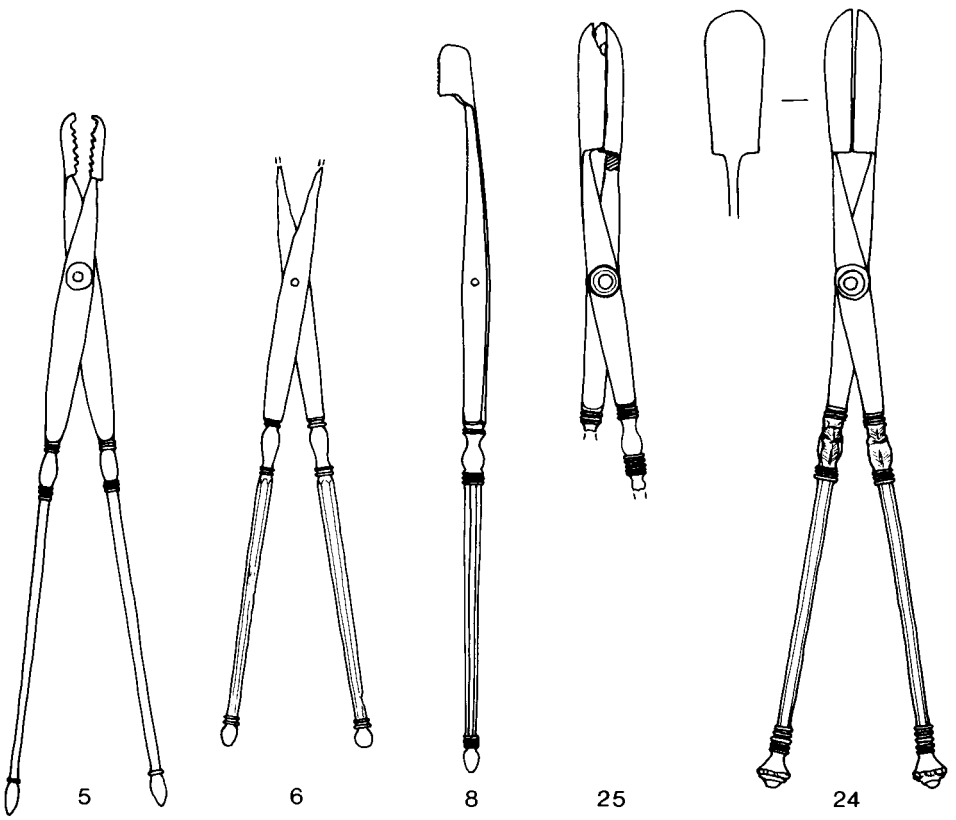


Fig. 5. Uvula forceps, arranged according to handle decoration. Cat. nos. 5, 6, 8, 25, 24.

Perhaps more surprising than the paucity of dating evidence is the very small number of associations. Only the Bristol City Museum *staphylocaustes* (no. 24), the *staphylagra* from Paris (no. 4), the reported examples of both types of forceps from Marcianopolis (nos. 19, 26), and two *staphylagra* and a hybrid in the Ashmolean *instrumentarium* (nos. 14, 15, 22) are known to be directly associated with other surgical instruments. As it happens, each of these associations seems to indicate a slightly different context. The find known as the 'surgeon of Paris' *instrumentarium* was probably a hoard buried in about A.D. 275 to judge from the coins that were found with it (Sorel, 1984). It would appear to have been the set of a well-equipped physician-surgeon. The most notable aspect is the disproportionately high number of forceps: including the *staphylagra* there are eight examples representing six different types. Here, then the *staphylagra* was part of a comprehensive set of forceps.

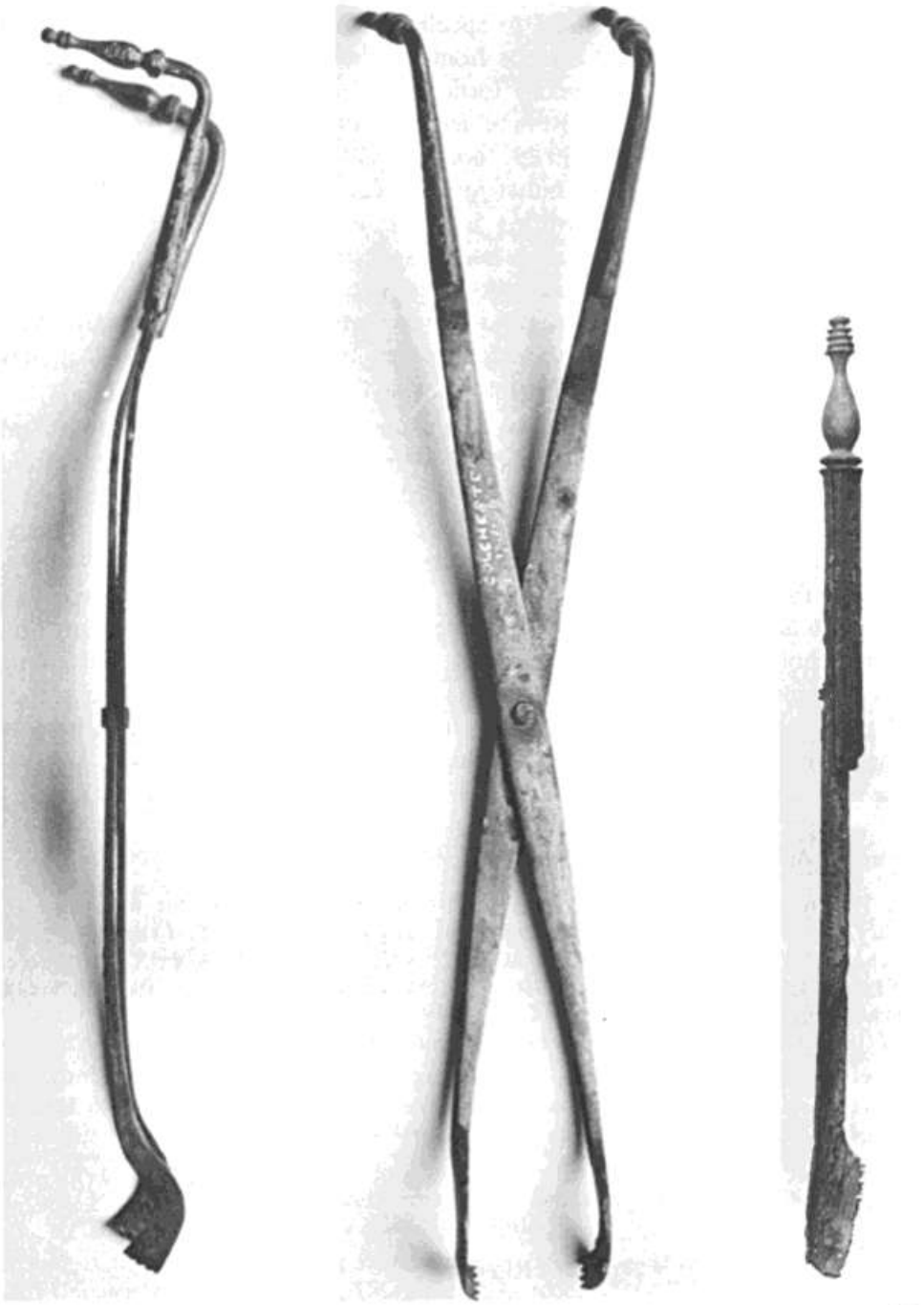
At Marcianopolis, on the other hand, where a very large number of instruments was found on the floor of a house destroyed by fire in the first

half of the 5th century A.D. (Minchev, 1983) there is a remarkable contrast between the numerous specialist instruments and the paucity of basic tools – only one scalpel, one hook and no normal forceps. There the uvula forceps, reputedly a *staphylagra* and a *staphylocaustes*, appear to have been part of a comprehensive set of specialist instruments with which the surgeon could have carried out bone surgery, lithotomy, gynaecological examinations and eye operations in addition to uvulectomy and haemorrhoidectomy. Similarly, the Ashmolean *instrumentarium* (Jackson, forthcoming) combines a range of primary surgical tools and pharmaceutical implements with a number of more specialised instruments. Bone surgery, uvulectomy and haemorrhoidectomy may have been specialities. Regrettably the place and circumstances of discovery of the set are unknown.

Finally, the Bristol City Museum *staphylocaustes* is part of a small group of richly-decorated instruments – *staphylocaustes*, bifurcated sharp hook, combined sharp and blunt hook, and scalpel – which may have belonged to a specialist in throat operations. For uvula forceps, sharp hooks and scalpel are the instruments recommended for both uvulectomy and tonsillectomy. Certainty is lacking, however, for while stylistic considerations and metal analysis (Jackson, forthcoming) prove that the four instruments were made as a set in the same workshop, we cannot tell whether there were originally more instruments in the set.

As we have seen, the *staphylagra* and *staphylocaustes* were used both for uvulectomy and haemorrhoidectomy. We need not doubt that they were sometimes used for other operations too. Paul (VI, 78) recommended the *staphylagra* for fixing and excising callus in the operation for anal fistula, and the instrument could have been used to advantage in the removal of anal condylomata and various other types of growth and tumour (see e.g. Celsus, *De med.*, VII, 30, 2; Paulus Aegineta, VI, 80). Other possible operations with the *staphylagra* include clitoridectomy (Paulus Aegineta, VI, 70; Aetius, XVI, 103, 106; Muscio, XXVI, 76); the removal of excess skin of the eyelid in trichiasis (Paulus Aegineta, VI, 8); substitution for the lithotomy scoop in the removal of calculus from the urinary bladder (Celsus, *De med.*, VII, 26; Künzl, 1983b); and, perhaps, the extraction of both bone fragments and foreign bodies – especially slingshot and arrow-heads – from wounds. In this context it is noteworthy that the 14th century French surgeon Guy de Chauliac recommends a toothed forceps for the removal of arrowheads. His description of the instrument, « the tenacles of Auycen ... toothed like half moons » (Ogden, 1971, p. 188, lines 20-22) sounds very much like the Roman *staphylagra*.

Much more so than today the surgeon of antiquity would have had to improvise in order to compensate for his restricted range of specialist instruments. As well as putting specialist instruments to wider use, 'one-



23 Plate 1

20 Plate 2

Plate 1. Cross-legged forceps, from Colchester. Cat. no. 23 (Photo : author)
Plate 2. Spring forceps, from Colchester. Cat. no. 20 (Photo : British Museum).

off' instruments could be made to special order. This 'blurring of edges' is «highlighted by two hybrid forceps from Colchester. One (no. 23) is a cross-legged instrument whose overall form is closer to that of the *staphylagra* than to any other type of Roman forceps (Pl. 1). However, the jaws are those of a toothed fixation forceps, not a *staphylagra*, and from the similarity of the instrument to modern bullet forceps (e.g. Down's, 1929, p. 33, nos. 33/2, 33/3) we are perhaps justified in regarding it as a specially adapted forceps for the removal of arrowheads and other projectiles. The second hybrid (no. 20) has fine-toothed jaws of the size and shape of the *staphylagra* but is a spring forceps, not a cross-legged instrument (Pl. 2). Nevertheless, it has the remains of a ring-slide for locking the jaws together, and it may be regarded as a variant form of the uvula forceps.

In conclusion, there can be little doubt that the *staphylagra* and *staphylocaustes* of the classical medical writers equate with the toothed and untoothed hollow-jawed cross-legged forceps found in the archaeological record. The strikingly greater proportion of the toothed to untoothed forceps must indicate the greater versatility and effectiveness of the *staphylagra*. Despite the range of other operations that were probably performed with the *staphylagra* it is likely that it was designed primarily for uvulectomy and haemorrhoidectomy. Although current medical opinion is that uvulectomy was a pointless operation, it is at least clear from the written descriptions of the operations, and, above all, from the quality of the instruments themselves, that the amputation could be performed effectively.

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CATALOGUE

Staphylagra

Type I - cross-legged with straight arms

1. Caerwent, from the Roman town of *Venta Silurum* (Fig. 4,1). Newport Museum and Art Gallery. D2 843. Complete, but teeth damaged on both jaws. One handle broken at moulding. Plain rivet. Unpublished. Newport Museum catalogue, forthcoming.	Context unknown.
2. Cyrene, Libya. Cyrene Museum. Complete. Hyslop and Applebaum, 1945, p. 44-45, Pl. VIII, 2, far right.	Context unknown.
3. Ostia. Ostia, Museo di Ostia, 4235. One handle broken at the moulding. The jaws are perforated. Longfield-Jones, 1974, p. 279 ff.	Context unknown.
4. Paris, 180 avenue de Choisy. In private hands. Complete. Plain rivet. Deneffe, 1893, p. 54, Pl. 6, fig. 2 ; Pl. 7, fig. 1 ; Milne, 1907, p. 97-98, Pl. XXXI, 1 ; Sorel, 1984, p. 21-23, 41, Pl. XVII, s, p. 226-232, fig. 133c.	Part of a large medical *instrumentarium* buried *c.* A.D. 275.

5. Rome, River Tiber (?) (Fig. 5,5). Context unknown.
Rome, Museo Archeologico Nazionale.
Complete. The jaws are perforated. The pivot assembly includes a disc washer.
Tabanelli, 1958, Pl. LI, 1 ; Reggiani, 1988, p. 455-461, fig. 10.

6. Tartûs, Syria (Fig. 5,6). Context unknown.
Oxford, Ashmolean Museum, 1889. 822.
Jaws missing.
Unpublished.

7. Trier, Altbachtal (Fig. 4,7). Context unknown.
Trier, Rheinisches Landesmuseum, ST. 4907 b.
Only one leg survives. Its handle finial is missing.
Cüppers, 1981, p. 35, fig. 19,3 ; Künzl, 1984, p. 160, Pl. 7, CI.

8. Italy (Fig. 5,8). Context unknown.
Worms, Städtisches Museum. Heyl collection ; brought, with other instruments, from Italy.
Only one leg survives.
Westdeutsche Zeitschrift, 4, 1885, p. 209 ; Künzl, 1979/1981, p. 55, Pl. 4, 6.

9. Provenance unknown (Fig. 3,9). Context unknown.
Bonn, Rheinisches Landesmuseum, 271.
Bought at auction of Garthe collection, 1877.
Complete. Plain rivet.
Bonner Jahrbücher, 71, 1881, p. 118 ; Künzl, 1986, p. 505-506, fig. 12.

10. Provenance unknown (Fig. 3,10). Context unknown.
Cologne, Römisch-Germanisches Museum, D 3743. Diergardt collection.
Complete. The jaws are perforated. The pivot assembly includes a pair of disc washers. The pivot has been positioned a little beyond the point of maximum expansion of the arms.
Unpublished.

11. Provenance unknown (Fig. 4,11). Context unknown.
London, British Museum, GR 1814, 7-4, 969.
Towneley collection.
Complete. Plain rivet. Handles decorated with thin bands of black inlay.
Deneffe, 1893, p. 54, Pl. 6, fig. 6 ; Walters, 1899, p. 313, no. 2317 ; Milne, 1907, p. 97, Pl. XXX, 1.

12. Provenance unknown (Fig. 3,12). Context unknown.
London, British Museum, GR 1878, 10-19, 145. Presented by General Meyrick, 1878.
Complete. The jaws are perforated. The pivot assembly includes a single disc washer. The pivot has been positioned a little beyond the point of maximum expansion of the arms.

Deneffe, 1893, p. 54, Pl. 6, fig. 3 ; Walters, 1899, p. 313, no. 2316 ; Milne, 1907, p. 97, Pl. XXX, 2 ; Sudhoff, 1926, p. 109-110, Pl. 66.

13. Provenance unknown (Fig. 4,13).
Naples, Museo Archeologico Nazionale.
Borgia collection.
Both handles broken at mouldings. The jaws are perforated. Plain rivet.
Vulpes, 1847, Pl. II, figs. I and II ; Deneffe, 1893, p. 55-56, Pl. 6, fig. 4 ; Milne, 1907, p. 98, Pl. XXXII, 3.
Context unknown.

14. Provenance unknown.
Oxford, Ashmolean Museum, 1990. 30.
Complete. The jaws are perforated.
The pivot assembly includes a single disc washer. The pivot has been positioned a little beyond the point of maximum expansion of the arms.
Unpublished. Jackson forthcoming.
Part of a large medical *instrumentarium*. Circumstances of discovery unknown.

15. Provenance unknown.
Oxford, Ashmolean Museum, 1990. 31.
Jaws missing. Plain rivet.
Unpublished. Jackson forthcoming.
Context as no. 14.

Type II - cross-legged with bowed arms

16. Ancaster, Lincolnshire (Fig. 3,16).
In private hands.
Complete. Plain rivet.
Unpublished.
Context unknown.

17. Augst, 'beim sog. Tempel' (Fig. 4,17).
Basle, Historisches Museum, 1907. 1506
Complete. Plain rivet.
Milne, 1907, p. 98, Pl. XXXI, 2 ; Tabanelli, 1958, Pl. LI, 4 ; Riha, 1986, p. 88, 176, 186, Pls. 61 and 71, no. 678.
Context unknown.

18. Avenches.
Avenches, Musée Romain.
One jaw missing. Plain rivet.
Tabanelli, 1958, Pl. LI, 3.
Context unknown.

Uncertain example

19. Marcianopolis, Devnya, Bulgaria.
Small. Distorted. Jaw(s) broken.
No other details available at time of writing.
Minchev, 1983, p. 145 (no. illustration).
Part of a large group of medical instruments found on the floor of a house destroyed by fire in the first half of the 5th century A.D.

Hybrids

20. Colchester (Pl. 2). Context unknown.
London, British Museum, PRB 1870, 4-2, 220. Pollexfen collection.
Spring forceps, with tooth-edged, hollow, spoon-shaped jaws. One jaw and part of the arm missing. Fragmentary lock-ring.
Møller-Christensen, 1938, p. 129-130, fig. 199 a-b.

21. Italy. Context unknown.
Kassel, Staatliche Kunstsammlungen. One of ten instruments, part of a collection brought back from Italy, 1776-1977.
Spring forceps, with tooth-edged, hollow, spoon-shaped jaws. Complete.
Bieber, 1915, p. 112, Pl. LIX, no. 672 ; Krug, 1985, p. 88, fig. 31a.

22. Provenance unknown. Context as no. 14.
Oxford, Ashmolean Museum, 1990. 22 a-b.
Cross-legged forceps, with broad, toothed jaws. One jaw missing. The handles have acanthus mouldings and lion's head finials.
Unpublished. Jackson forthcoming.

23. Colchester (Pl. 1). Context unknown.
Colchester Museum, 178. 1896.
Cross-legged forceps, with inturned toothed jaws. Plain rivet.
Laver, 1896, p. 99.

Staphylocaustes

24. Italy (Fig. 5, 24). One of a set of four medical instruments. Circumstances of discovery unknown.
Bristol, City Museum and Art Gallery, FT 1449. Fawcett collection.
Complete. The pivot assembly includes a pair of large moulded disc washers.
The handles have acanthus mouldings and lion's head finials.
Unpublished. Jackson forthcoming.

25. Provenance unknown (Fig. 5, 25). Context unknown.
Vienna, Kunsthistorisches Museum, Antikensammlung, VI, 1245.
Both handles broken at mouldings. The pivot assembly includes a pair of large moulded disc washers.
Deneffe, 1893, p. 56-57, Pl. 6, fig. 1 ; Milne, 1907, p. 98-100, Pl. XXXII, 2.

Uncertain example

26. Marcianopolis, Devnya, Bulgaria. Context as no. 19.
No details available at time of writing.
Minchev, 1983, p. 145 (no. illustration).