Archaeological remains as a source of evidence for Roman Medicine

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In order to understand Roman medicine most scholars rely on ancient medical texts to understand the Roman views about the functions of the body, the etiology of diseases, surgical procedures and perceptions of health. Yet, archaeological remains of medical instruments and buildings identified as hospitals also shed light onto past medical practices. In this paper, I will provide general information about what has been said by scholars on the archaeology of medical tools and *valetudinaria* (hospitals) with comparisons to ancient medical texts. Archaeologists tend to limit themselves to relying on these texts to describe the functions of medical tools and identification of hospitals; yet, by using different archaeological methods of interpretation it is possible to know more about these objects and structures. In regards to medical tools one can learn about other functions they may have served and what people thought about them. It will also be demonstrated that there may be an over or misinterpretation of buildings identified as hospitals in the Roman army that are based on early twentieth century archaeological methods of interpretation and expectations of what a hospital should be. This paper is a brief overview of four previous works (Baker 2002a, 2002b, 2004a, 2004b) that explore these questions in more detail. The paper is laid out to first provide a preliminary background to the types of medical tools that survive and what is said about them in the ancient medical texts. Following this is a brief discussion of their other functions and meanings. Once the material culture is explained, a discussion of the arguments for and against the identification of Roman hospitals will be presented.

Archaeologists have interpreted medical instruments through reference to the Greek and Roman medical texts as a means of understanding their surgical functions (Braadbaart 1994 a and b; Jackson 1990, 1993, 1994b, 1995, 1996; Künzl 1983, 1996; Milne 1907). First it must be stated that there are very few medical tools from the Hellenic and Hellenistic periods (5th century BC to 1st century BC) so the focus is on Roman medical tools that date from the first to fourth centuries AD. In comparison with the large numbers of personal ornaments and small metal artefacts from Roman contexts, the quantity of medical instruments that survive in the archaeological record is not great. The majority of instruments that have been found are more common types such as probes, forceps and scalpels.

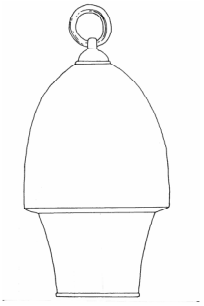
To introduce the reader to the different types of medical tools I will now present descriptions of those that have been found in the archaeological record. The following descriptions of medical implements are arranged in alphabetical order and are based on those provided by a number of scholars who have written about them (e.g. Bliquez 1981, 1988; Braadbaart 1994b; Jackson 1990, 1994b; Künzl 1983, 1996; Milne 1907). Normally the tools are divided into two groups by scholars: those that are strictly surgical and those that had the dual function of being both surgical and toilet instruments. The Romans made no such categories when discussing the medical instruments and neither shall I because the categories are modern and distort the ancient typologies. Many of the tools placed in the specific categories have both medical and pharmaceutical functions as well as non-medical functions. The list provided is not complete, as other tools are

known of in the archaeological and literary record, but they are rare, and this paper is meant to provide an introductory background to the subject. Furthermore, this section does not take into consideration other objects that were used for healing such as amulets and charms because this aspect has not been studied in much detail in relation to ancient medicine.

THE INSTRUMENTS

Cauteries (*ferrum cadens, καυτήριον, καυτήρ*). Very few cauteries are known in the archaeological record because, according to Jackson, few probably would have been purpose made since they were simply a vehicle for transferring heat (1994b: 177-8). Most were probably made of iron as their Latin name suggests and therefore would have corroded, explaining the small numbers in the archaeological record. They were used for haemostasis and to remove unhealthy tissue or bone. The cauterisation of unhealthy tissue was done to allow for the healthy tissue to remain undamaged whilst the unhealthy area was being treated (Jackson 1994: 178). It could also be used on boils and gangrene (Albucasis 1. 51-52). A special implement was developed for cauterisation of areas that were difficult to reach. A tube was placed over the hot cautery so that the skin of a non-infected area would remain unharmed (Cels. 7. 11). Since there were many shapes and sizes referred to in the written sources it is likely that doctors could have used a variety of instruments, such as double ended probes, double simple probes as well as the spatula from a spatula probe to fit the size and shape of the area in need of treatment (Braadbaart 1994b: 54; Künzl 1983: 25-6; Milne 1907: 116-20).

Cupping Vessels (*cucurbitula, σικύα, κύαθος*). Celsus says that there is scarcely any malady in which blood may not be let (2. 10. 1).

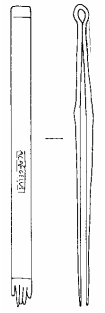


Cupping Vessel (height 144mm). After Jackson 1990: Fig. 1:1.

According to Albucasis the vessels came in different sizes: large, medium and small depending on the specific areas of the body that might have required different shapes and sizes of the vessels (Spink and Lewis 1973: 46). They were also made of various materials. The cupping vessels made of horn had a hole on the top that was used for creating a vacuum effect. Those manufactured in copper alloy were solid and a piece of burning lint was placed inside them to create a vacuum. Milne quotes Oribasius, who says that they could also be made of glass to measure the amount of blood that was removed from the body (1907: 102-3). Oribasius said that sometimes the lips of the vessel were flat and other times concave, (*Med. Coll*. 7. 16; Milne 1907: 102). These instruments were used for both wet and dry cupping. For wet cupping a knife was used to make a small incision in the skin and then the vessel was placed over it, drawing out the tainted blood or infected matter. Dry cupping was used in the release of bad humours, and was suggested for headache and painful joints (Jackson 1994b: 182-4).

Forceps (*vulsella, τριχολαβίς)* This instrument has many functions and basically acts as an extension of the fingers. It could have been used for personal hygiene and

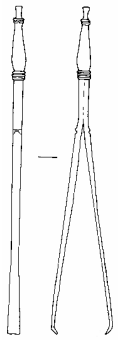
depilation. A variety of forceps have been found in the archaeological record. Most of the simple tweezers were made of a single strip of metal bent in the middle with straight edges or slightly turned-in edges, some of them are cast with finial decorations. Those with smooth jaws were recommended for epilation in granular conjunctivitis (Paul Aeg. 6. 13; Milne 1907: 91). They could also be used in the removal of bone splinters (Jackson 1994b: 174).



Forceps made of one strip of metal with toothed edges (length 107mm). After Jackson 1990: Fig. 3:9.

Toothed edges with fixation clamps are found on some types of forceps (myzon, vulsella, *μύδιον, σαρκολαβίς*). The teeth were designed to make traction on an object. They were applied to the removal of warts and partial excision of the uvula, or on tumours found on other areas of the body (Celsus *de med* 7. 30. 2; Künzl 1983: 18-19).

Some forceps have jaws that come out at an angle, rather than being placed straight on the end of the forcep handles. These usually have concave jaws on the interior of the instrument and convex jaws on the exterior. Sometimes there are fine teeth at the end of the jaws. Although Paul of Aegina does not provide a separate name for these forceps, it is suggested by Milne that these were the type used when Paul of Aegina was discussing the operation for an eyelid with trichiasis (Paul Aeg. 6. 8).



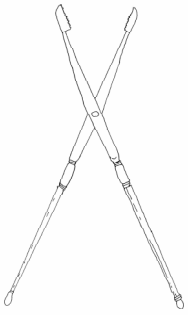
Forceps with edges turned inwards (length 134mm). After Jackson 1990: Fig. 2:3.

Dental forceps (*forfex, ὀδοντάγρα, ῥιζάγρα*) are designed more specifically for the task of tooth removal. They have powerful jaws sometimes with an indentation for the tooth, so the tooth would not be crushed during removal, which would have caused greater problems. To create a stronger hold on the tooth the arms of the dental forceps were crossed in the centre and attached with a bolt (Jackson 1994: 175-6).

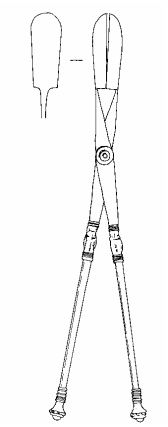
Dental forceps (length 180mm). After Matthäus 1989: Fig. 13.

For the removal of bone and missiles, such as arrow and spearheads, forceps were made with strong arms crossed in the centre and for an even greater grip the head of the forceps had serrated teeth.

The removal of the uvula was a common operation in the Roman period, so a specific type of forceps was designed to aid in its removal, called the *staphylagra*. These could also be used in a haemorrhoidectomy (Jackson 1994a: 168). The *staphylagra* were made of two arms joined in the centre and the jaws of the instrument were toothed in order to crush the uvula and clamp it down while another set of forceps was employed to twist the uvula off the soft pallet of the throat.



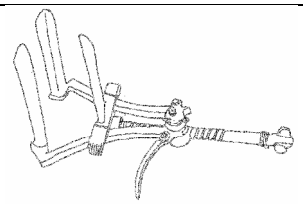
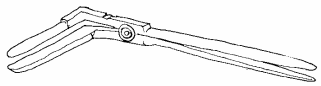
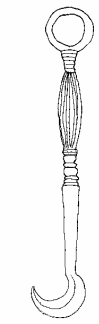
Staphylagra (length 192mm). After Jackson 1990: Fig. 3:



If a patient was unable to handle the pain of the forceps, *staphylocaustes* were suggested for both the removal of the uvula (Paul Aeg. 6. 31) and for haemorrhoids (Paul Aeg. 6. 79). These forceps were similar in design to the *staphylagra*, but rather than having toothed forceps they had ends with hollowed out centres in which to place a caustic medicament, used to burn the uvula or haemorrhoid. The uvula would die and eventually come off the back of the throat (Jackson 1994a: 169-70). The extant varieties of these have both straight and bowed arms; the straight arms are suggested for the throat and the bowed for external haemorrhoids (Jackson 1994b: 172).

Staphylochaustes (length 210mm). After Jackson 1990: Fig. 3:8.

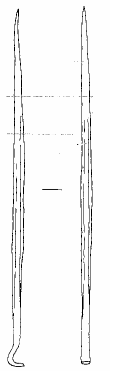
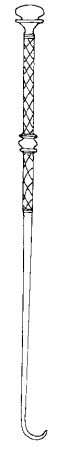
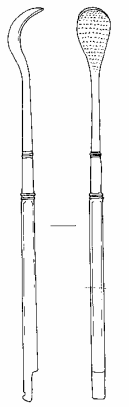
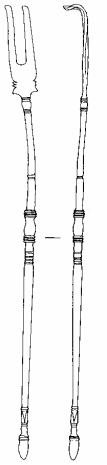
Gynaecological and Gender-specific instruments. Some instruments were specifically designed for the male and female bodies. The catheter, discussed under syringes and tubes, was designed specifically for each sex. Soranus mentioned a number of implements developed specifically for gynaecological treatments and childbirth: vaginal specula, uterine dilator, decapitating knife and a foetal hook, to name a few. These instruments, however, could be used to treat both the male and female bodies, as seen with the rectal spculum (Braadbaart 1994a: 164; 1994b: 52). The design of the instrument had a handle and two prongs that would separate when the handle was pulled open. This tool could have been used for the removal of weapons, to treat problems in the rectum, and it was also recommended for small women and girls as a vaginal speculum.

		
Vaginal speculum. After Matthäus 1989: Fig. 27.	Rectal speculum. After Matthäus 1989: Fig. 27	Foetal hook (length 150mm). After Milne 1907: Pl. 5

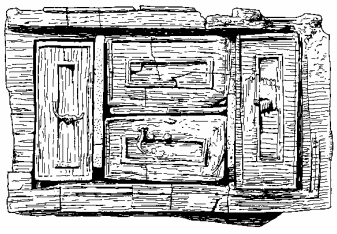
Hooks. These were used for seizing and holding tissue, boils and tonsils (Milne 1907: 85-7). The two most common hooks were sharp and blunt forms. The sharp hooks (*hamulus acutus, uncus*, *ἄγκιστρον*) were made of a copper-alloy and used to hold open the margins of a wound, giving the surgeon room to operate (Jackson 1994b: 172; Milne 1907: 87). Blunt hooks (*hamus retusus, τυφλάγκιστρον*) were used in more delicate operations such as raising veins. In some instances the instrument has been found to have hooks on both ends. The lithotomy hook (*uncus)* was a blunt hooked spoon or scoop roughened on one side and designed for removing stones from the bladder or urethra. The hook was rough on one side so that it could grab the calculus and had a smooth side

that would not harm the soft tissue on the interior of the body. Some handles had slotted sockets for a knife that could be used for the first incision (Jackson 1994b: 173). Forked, or bifurcated, hooks were also used for this purpose because they have blunt ends, rather than sharp ones.

For stone extraction Oribasius mentions two hooks: the λίθουλκος (45.6.2 and 6 in Bliquez 1985: 120) was used like a miniature crow-bar, and the Κιρσουλκός (45.18.5 in Bliquez 1985: 121) was shaped like the Greek letter gamma. There is a variety of shapes, but generally one must question whether all of these more specialised instruments were necessary for the doctor's kit, or if they could have functioned adequately with a sharp and blunt hook.

			
Blunt hook. After Jackson 1990: Fig. 2:8.	Sharp hook. After Jackson 1990: Fig. 2:2	Double-ended lithotomy scoop After Jackson 1990: Fig. 6:7.	Birfurcated hook After Jackson 1990: Fig. 2:5.

Medical Boxes. It is difficult to say whether these boxes were all meant for a doctor's use, as they could also have been used as paint cases, or for cosmetics and jewellery, for example. They were made out of a number of materials such as copper-alloy, ivory and wood. The wood ones were probably the least expensive to make, but also quite perishable, so very few remain. They were rectangular in shape ranging from seven to eight centimetres in length and about five centimetres wide and two centimetres deep. They had separate compartments covered with individual tops (Milne 1907: 170; Sobel 1991: 121-2).



Medical box. After Künzl 1983: Fig. 76

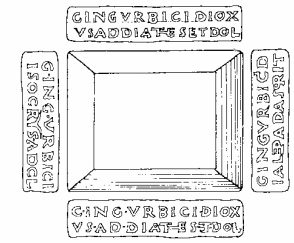
Another doctor's case was the cylindrical instrument case, about 20 centimetres long and one to two centimetres wide. These could only contain small number of instruments (Milne 1907: 168-9). There are also representations of folding boxes used for containing surgical knives and scalpels (Milne 1907: 170).

Needles. Needles are important in a number of surgical procedures. There are two types known of through the literature, those with eyes used for suturing wounds and lacerations and for sewing bandages and those with cylindrical handles that are made of copper-alloy with a hole in one end for a steel needle. It is too difficult to make an identification of suturing needles as they would appear like common sewing needles, although in good condition they would need a cutting edge (Braadbaart 1994b: 54; Jackson 1994b: 177). The handled needle was used for more varied procedures than suturing. There were a number of proposed uses for the handled needle: puncturing skin, perforating pustules and raising the skin off the eyeball (Cels. 5. 28. 19C; 5. 28. 4D; 6. 18. 9C).

Needle handle. After Jackson 1990: Fig. 4:5.

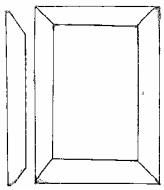
The cataract needle (*acus*) was said to be pointed sufficiently to penetrate the eye, but not so narrow as to be unable to break up the cataract (Cels. 7. 7. 14D; Jackson 1994b: 177; Künzl: 1983: 26-7; Milne 1907: 74-5). The operation seems to have been common, or at least known about, as Martial accuses one doctor of being very careless by stating that a gladiator had formally been an eye doctor, but technically he was still performing the same job (8. 74).

Oculist Stamps. These stamps are found in a number of sites throughout the empire, though the majority come from the north-western provinces of Gallia Belgica and Lugdunensis. They were used as a stamp to mark medicines for eye diseases. They are made of stone and have the name of the doctor, illness and the ointment inscribed on the sides. As for their size and shape, the oculist stamps are generally square and about one or two centimetres wide and a few millimetres in depth (Jackson 1996: 2,240-3).



Oculist stamp. After Künzl 1983: Fig. 48.

Ointment Pallet. Although this is not a surgical instrument, it does have associations with pharmaceutical procedures and is found frequently in the archaeological record. The pallets are made of stone and often found worn down on one side, due to the grinding of medicines that it was used for (Milne 1907: 171).



Ointment pallet. After Matthäus 1989.

Probes. These instruments, also referred to as sounds, are the most common type of instruments overall. The probes were fabricated as a multi-purpose tool that could be utilised in a number of surgical procedures, minor operations, pharmaceutical preparations, personal hygiene as well as non-medical procedures such as mixing paints.

Double Olivary End Probe (*διπύρηνος μήλη, ἀμφίσμίλος*). This was a simple instrument that had an olivary end placed on both terminations of its thin handle. The olivary ends could be used in pharmaceutical procedures to mix ointments. It was also

possible to use it to create a drip effect much like a modern eye-dropper by placing a piece of cloth soaked in a liquid medicament above the olivary end, and squeezing the cloth so that the ointment would slide down over the termination and drip onto the area in need of the medicine. As a surgical implement the olivary end could be used to explore fistula (Cels. 5. 28. 12 C) and for examining carious bone (Cels. 8. 2. 3).

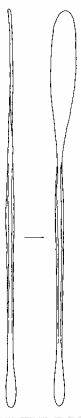
Double-ended olivary probe with eye. After Jackson 1990: Fig. 4:7

Double Simple Probe (*specillum, ἀπυρηνομίλη*). This instrument is not recognised often in the archaeological record possibly because its simple design, consisting of a thin rod with two blunt ends can have easily been transfigured or mistaken for another object. They were used in delicate probing and may even have served as a tiny cautery. Paul of Aegina suggests using the olivary end of a probe to cauterise eyelashes in the treatment of trichiasis or granular conjunctivitis, where the eyelid turns in upon itself, and the lashes then scratch the eye (6. 14). It is possible that an olivary end to a probe might have been too large in certain instances for probing, so perhaps the double simple probe was employed. Furthermore, the pointed end of an ear probe could probably serve the same function, perhaps being another reason these are not found often in the archaeological record.

Ear Probe (*oricularium speculum, μηλωτίς*). These instruments are generally called ligulae. However, given the Latin name, ear probe is also correct. There are two types those with flat ends and those with small round spoon-scoped ends (Braadbaart 1994b: 54; Jackson 1994b: 181; Künzl 1983: 27-8; Milne 1907: 63). They have thin handles that terminate in blunt points on one end, whilst the utility end has a small, flat slanted circular head which is generally quite small, but does sometimes measure to five or six millimetres in width, but can still fit into the ear. For medical purposes they were dipped in resin and could have been used to remove foreign bodies from the ear such as maggots (Cels. 6. 7. 5).

Flat-headed ear probe. After Jackson 1990: Fig. 4:9

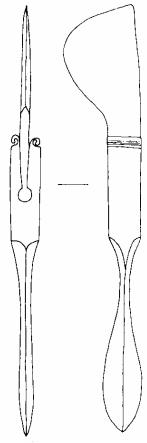
Spatula probe (*spathomele, σπαθομήλη*). The instrument consists of a long thin handle and tends to range in size from roughly 6 to 15 centimetres with a spatula on one end of its handle and an olivary probe on its other end, indicating its multi-functionality. The spatula is usually leaf-shaped and tends to be flat on one side and slightly rounded on the other. Some spatula ends are quite thin, perhaps five or six millimetres in width, whilst others are short and blunt. Some have more of a rectangular shape to them and others have a spatulat blade on both ends. It could be used for spreading medicaments on infected areas of the body as well as mixing medicines on an ointment pallet. Sometimes the spatula could be used as a cautery, as Soranus mentions using it on the umbilical cord (*Gyn* 3. 27, Milne 1907: 60). It could also be used as a tongue depressor and as a blunt dissector (Milne 1907: 59-60). The olivary end could be used in the same way as many already suggested for the double-ended olivary probe.



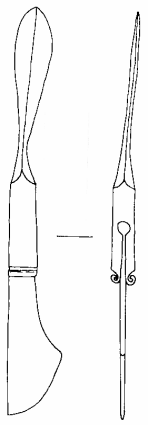
Leaf-shaped spatula probe. After Jackson 1990: Fig. 4:15.

Spoon Probe (*cyathiscomele)*. This is similar to the spatula probe, but has a narrow leaf shaped spoon in place of the spatula. They also have the same olivary end as spatula probes. For pharmaceutical purposes the spoon was used to remove medicines from their flasks, explaining the many different sizes of the spoon and handle. It might have been used to mix ointments as well. For surgery Milne suggests it might have been used as a curette (1907: 62). There is also the possibility that it was applied in lithotomy operations to help remove stones from the urethra (Jackson 1994b: 181; Milne 1907: 62).

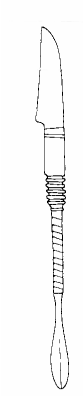
Scalpel (*scalpelus, σμίλη*). This is one of the tools recommended most often in Roman surgical procedures (Braadbaart 1994b: 52; Jackson 1994b: 169-71; Künzl 1983: 15-16; Milne 1907: 27). The remains of the instrument, usually just the handle, are found throughout the empire. The handles are usually rectangular, with a blunt leaf shaped blade on one end that was recommended in operations requiring blunt dissections. The opposite end had a slot for a steel or iron blade. The steel from Noricum was said to be of the highest quality for blades (Galen 2. 682 K). There were a number of different shapes to the blade but the most common seems to have been the bellied or convex form (Jackson 1994b: 170).



Scalpel. After Jackson 1990: Fig. 1:6.

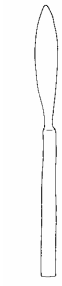


Scalpel. After Jackson 1990: Fig. 1:7.



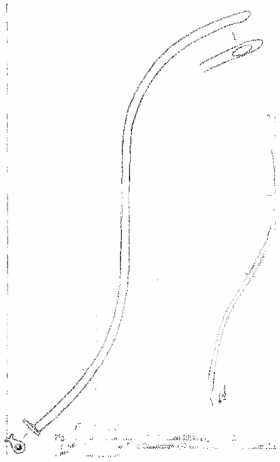
Scalpel After Jackson 1990: Fig. 1:8.

Surgical Knives. Along with scalpels these are mentioned frequently through the medical literature, but very few survive in the archaeological record. One knife that has been identified is the lithotomy knife, a form with a hook on one end and a sharp knife on the other (Jackson 1994b: 170-1). Nonetheless, Celsus states that a scalpel could also be used for removing a stone (Cels. 7, 26, 2 N-O). Overall, however, there are smaller numbers of these tools in the archaeological record and this might be because the scalpel had a number of blades and could have been used in the same capacity as the knife. Another knife that had a distinct function was the lancet (*phlebatom*) that was used in scarification during wet cupping.



Surgical knife. After Deringer 1954: Fig. 81: 2.

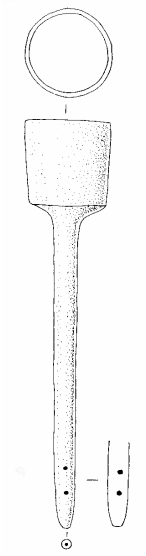
Syringes and Tubes. These are not commonly found because they are hollow and could quite easily have been misshapen, making them difficult to identify in the archaeological record. Celsus says that the tube either had upturned lips on one end or a collar around the middle so that the instrument would not become lost within the body (7. 15. 2). This might have been a problem with a dropsical patient who had tubes placed in his abdomen for draining water. Catheters are also found and are important for helping aid urination when the bladder was blocked by a calculus. The catheters were designed for both the male and the female body, thereby making them gender specific instruments. The males' were more "S" shaped and long whilst the females' were shorter and straighter (Jackson 1994b: 185). Three sizes were recommended for men and two for women. For men they were 15, 12 and nine fingerbreadths, while women were nine and six fingerbreadths in length. The differences in the male and female body designated the need for a gender specific design for the catheters. The instruments are basically hollow tubes with one end open like a straw and the other, which is to be inserted in the urinary tract, had a small hole on the side of the tube, rather than on the top, because this would allow for the top to have been rounded and inserted with more care.



Male catheter (length 285mm). After Jackson 1990: Fig. 6:2.

Female catheter (length 143mm). After Jackson 1990: Fig. 6:3.

The tube could also have been used as a clyster or syringe by attaching a bag or pouch to one end and squeezing it to introduce medicines into the body. Another tube has a plunger rather than a bladder. The medicines would have been placed in the tube in this instance and then a solid plunger would push it through a small hole at the opposite end (Jackson 1994b: 187; Milne 1907: 105). There was a *pyoilkos* mentioned by Heron in his *Pneumatica* (2. 18). It was a hollow injection pipe that was attached to a reservoir tube equipped with a close fitting plunger, itself a plugged tube. It was recommended for inserting liquids into an orifice of the body and also for drawing out infectious liquids from the body. It seems, however, that the *cannula* (hollow tube) with a stopper was more commonly used (Bliquez and Oleson 1994: 83-103).



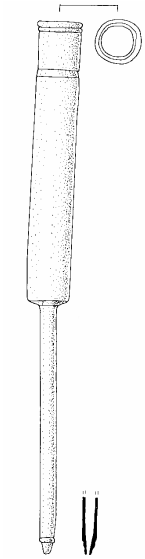
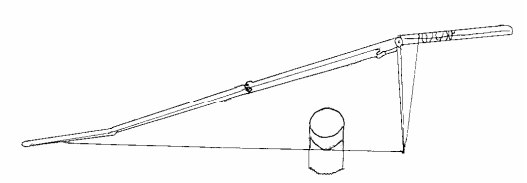


Fig. 115. Clyster. After Jackson 1990: Fig. 6:5.

Clyster or syringe. After Jackson 1990: Fig. 6:6.

Tools for battle wounds. There were special instruments designed for the removal of missiles and arrowheads, but these are not very common because other instruments, knives, probes and forceps, are also recommended for battle wound operations. The trepan with straps was developed for trepanation; however, the instruments could also be used for the removal of missiles from the bone. If the weapon had become lodged in a bone, the bone was drilled around the outer edges of the missile to make a larger opening around the weapon, which could be removed without damaging or splintering the bone, something that posed a threat if the weapon was pulled directly out of the bone. Furthermore, a bone cut with smooth edges would heal more easily. Another suggestion for avoiding further tissue damage was to place reeds around the barbed edges of the missile head, thereby protecting the tissue from being damaged even further when the missile was removed.



Trepanning blade with bow. After Jackson 1990: Fig. 5:8.

Two other instruments developed for the removal of implements were mentioned by Celsus. The spoon of Diocles is a much discussed instrument but no positively identifiable example is extant. Celsus says this instrument was developed to remove wide barbed missiles. According to Celsus the tool was constructed in two parts; one side had a long narrow scoop with a hole in the bottom to catch the pointed end of the missile and the sides of the instrument were turned inwards to keep the barbed ends of the arrow or spear from damaging the flesh upon removal of the weapon. The second part was a smooth blade basically placed behind the unprotected side of the spoon (Cels. 7. 5. 3 A-B).

The second instrument mentioned by Celsus is said to have been shaped like a Greek letter; however there is a lacuna in the text that states which Greek letter it is. It is possible that the letter Celsus was describing was an upsilon 'Y' because the description of how the instrument functioned sounds as if it might have been a speculum. The tool was supposed to spread the skin so the doctor could extract the weapon with greater ease (Cels. 7. 5. 2 B; Jackson 1994b: 189-90). He also suggests pushing missiles through the rest of their course or through a counter-opening, rather than pulling the missile out through the place where it entered the body (Cels. 7. 5. 2 A-B).

Tools for bone operations. Operations in relation to broken bones were treated like a craft such as carpentry. Celsus described in book eight of his *de Medicina* the tools used for bone surgery. Most of the tools recommended are described like carpentry tools (1994b: 190-5; Milne 1907: 121-36). These were saws, rasps, files and trepanning saws. The saw, for example, was a necessary tool used in amputations, but this practice was only recommended as the final choice in medical emergencies. Overall the tools for bone work are hard to identify because they were more likely to have been made of iron and mistaken for carpentry tools.

OTHER UNDERSTANDING AND USES OF INSTRUMENTS

Besides examining the instruments in relation to the literary sources as demonstrated above, it is possible to see how people felt about them and if they may have had any other uses by considering the archaeological context in which they were found. Concepts of illness and beliefs and fears related to them are embedded in a cultural framework of understandings of the body and medicine that are often not expressed in written or verbal form, and the attitudes about them can be mirrored onto the objects involved with healing. Thus, by learning how people thought of medical tools one can come closer to non-verbalised understandings of Roman medicine. There are a couple of points that are rarely explored in relation to these methods which can tell us much more about ancient medicine in the past. The first is to break away from the assumption that medical care would have been the same in all areas of the Roman Empire. It is evident from the medical texts written in the Classical period in areas around the Mediterranean that the writers had differing views of the functions of the body and how it should be cared for. There is also much evidence showing that there were many healing traditions in the Greco-Roman world. Celsus (*proem.* 30-1) stated that methods of practice were subject to the nature of localities, and he exemplifies that one method was required in Rome, another in Egypt and another in Gaul. He felt that if the causes of disease were understood by all cultures to be the same, then the different groups should employ the same remedies. He was aware that even if different groups had the same understandings of a specific cause for a disease, different treatments were still employed. These differences are also evident in the archaeological record. It is often forgotten that medicine and ideas about the body are culturally defined in the works that discuss archaeology and medicine. Although we refer to medicine from the Roman era as 'Roman medicine', which implies a standardised system, it is actually difficult to give an exact definition of what 'Roman medicine' was because of the lack of standardisation. There were different philosophical viewpoints on ways to treat the body, and no universal

means of training or testing doctors (Nutton 1995: 44-6). In conjunction with this, there were many folk remedies and religious ideas about treatments in existence that contradicted the medical writings, indicating that a doctor's care in the Roman world would differ according to the way in which the individual was taught the art.

This difference is clearly seen in the study of medical care for the Roman army. By examining medical tools and inscriptions mentioning doctors from military sites on the Rhine, Upper and Middle Danube and British frontiers, it became evident that there was not enough material to support the long-held belief that there was a uniform system of medical treatment in the army (Baker 2004a). Only certain units, mainly those from Gaul and Spain, had material remains of Roman medical tools and inscriptions mentioning doctors. A possible reason for this is that the Roman army consisted of soldiers, both citizens and non-citizens from various parts of the Empire, who could have rejected the use of Roman medicine in favour of their own. Recent studies of the Roman army are showing that there were various differences between units based on their cultural background, seen in their uniforms, fortification design and religious practices (e.g. James 2002). Through many anthropological studies, it is shown that medicine is intrinsic to one's cultural values because it conforms to understandings of the body and the care. People are often suspicious of medical practices that are foreign to their own and will continue to practice their own medicine or adapt new forms of medicine to fit into their beliefs when introduced to foreign practices (Kleinman 1980). Thus, by examining the archaeological material it is possible to show that there were differences in practice, and that Roman medicine, even in the army, was not the same throughout the empire.

The second point that can be made through a study of the archaeological remains is that it is possible to gain an understanding of how the healer, patient and others who might have come into contact with the instruments have perceived them. With this material it can be questioned whether tools were sometimes considered to be carriers of disease or bad luck, given their associations with the ill. Conversely it should be considered whether they might have been seen as being 'charmed' if they were used in a successful cure, simply associated with health or healing, or a person who cared for people.

Since Roman medical tools have mainly been examined for their surgical function, leading them to be described as though they were used in a wholly 'rational' manner, meaning their function was 'scientific' or surgical only, without the possibility that there might have been divine, magical or other complex cultural associations with them (Baker 2002a). Studies on the philosophy of ancient medicine and science demonstrate that there was not a dichotomous Cartesian view of the world between the sacred and the profane (Lloyd 1983). The comprehension of a majority of people in Greco-Roman times was that divine and supernatural agents were everywhere. At the same time the 'rational' aspects of medicine were not separated from 'irrational' practices and understandings in classical medicine. The two were so deeply enmeshed in one another that a separation cannot be clearly distinguished. These beliefs would have influenced the medical writers' world-view, as can be demonstrated in their works. For example in the Hippocratic work on the *Sacred Disease* the writer discusses the problem with charlatan physicians, who offered to purify people from illness and who believed that the illness was caused by the wrath of the gods. The main form of curing employed

by these healers was the use of magical spells and burial of offerings in the sea and ground. Rather than arguing against the idea that there were religious, or 'irrational' elements to the healer's practices, the Hippocratic writer states that people should be sent to temples for prayers, and offerings should be placed in the temples rather than burying them or placing them in the sea. The writer also believed the gods to be pure and would not inflict illness on a person, but if someone were suffering the deity would purify and sanctify the body. Thus, the acts of healing in the ancient world were never completely divorced from religious means of thinking.

To demonstrate this, a case study will be presented that examine the instruments in their archaeological context, in this instance medical tools that were found in rivers, where their symbolic role is displayed. Although the numbers of objects found in rivers is small, only 10 having so far been recorded, they should not simply be passed off as insignificant accidental lose. Six of the river finds occurred as small medical kits in cylindrical boxes, and this seems to be of some significance. The contents of the cylindrical containers vary, as some have instruments associated with the care of the eyes, whilst others have more general tools, such as different styles of probes. The cylindrical boxes were found in the riverbed of the Danube at the site of Sirmium (Milošević and Milošević 1966), in the Rhine at the sites of Mainz (Künzl 1993) and Wiesbaden (Schoppa1966), the river Maaseik in Belgium (Heymans and Janssens 1975/6), and the Soane in France (Feugère, Künzl, Weisser 1985), whilst a small number of single instruments have also been found in rivers. In Rome the river Tiber has yielded a speculum, cataract needle and *staphylagra* (or uvula forceps); it may also have yielded a number of probes, but there is little discussion of provenance in the publication on the objects (Reggiani Massarini 1988). In the Netherlands at least four instruments have been found in rivers, all but one in good condition. Of those in good condition there are a toothed and straight-ended forceps and a spatula probe from the Waal near Nijmegen, while a spatula probe was found in the river Maas near Nijmegen, as was a damaged spatula probe (Braadbaart 1994a). Künzl has generally argued that there is no significance behind instruments recovered from rivers, with the exception of the possible oculist tools found in Gaul, as he believes they were simply objects that were lost (1985) and he maintains that finds from a river do not have a context. However, it can be argued that the river is a context; although, at the same time, that context does not provide an exact location, and (because of recovery through dredging) it is difficult to know if there were any associated finds deposited with them and if so what they were. The low number of river finds would initially suggest that Künzl's argument is correct, but on closer examination it seems that the interpretation can be challenged. First of all, since the items are small, they may be missed in river dredging, and could be grossly underrepresented from their contexts. Secondly, it is very noticeable that six sets of medical instruments found in rivers were deposited in a cylindrical case, all made of copper-alloy. The instruments vary, but the boxes do not. As the numbers are small this might seem somewhat coincidental, but such containers are rare. Upon examination of the other contexts of these containers, with very few published exceptions, they only appear in one other place, and that is with burials.

Bradley (1992) has examined the deposition of artefacts in rivers for prehistoric Europe and argues that in some instances they seem to share many similarities with goods found in burials, but this is dependent upon spatial and temporal elements. For example,

cremation was widely adopted in Bronze Age Europe and it seems that rivers might have been used as places for the disposal of ashes because associated metal finds found in rivers from the same period are also found in burials. Cremation was also common in the Roman era and there might have been a connection between the tool containers found in rivers and elsewhere with inhumation and cremation burials.

In the context of burials, medical instrument grave goods could simply have been the property of the person buried, or perhaps a token item given by someone who was associated with the dead person. On another level the tools might have symbolised a mediation between the life and death, as the tools of healing did have the power to save lives. Objects contained in burials from the Roman period have been argued to embody such messages, for example placing a coin in someone's mouth would not only have been used to pay the ferryman, but could also be a sign of someone passing between the stage of life and death.

Here the argument can also be made that these were used for votive offerings (Bradley 1992). When the Romans expanded their empire they often incorporated indigenous religious practices into their institutional structure. There is much artefactual evidence from the Rhine, Danube and rivers in France for objects being deposited from the Neolithic period into the Iron Age. Often the items deposited were weapons such as daggers, swords, shields and helmets, but smaller more mundane objects are also found such as axes, coins and pottery. At Flag Fen, in Cambridgeshire, and dating to the early Roman period, a cosmetic set and bronze shears were discovered that could be either medical or associated with the body in other ways (used for cutting hair, for example). It is argued that the Roman finds demonstrate the continuation of votive depositional practices into this period. It may also be that the single medical instruments deposited alone were intentionally placed in the rivers as a component of ritual practices. It is difficult at present to say whether this was an empire-wide practice, but on the basis of available evidence, it seems to have been more of a western practice since most of the deposits were found in the Rhine, Danube and in Gaul. .

As for a more direct association with medicine and the body, votive offerings of terracotta and ceramic models of body parts have been recovered from in rivers as well. The Tiber, having had a sanctuary to Asclapius, yielded many such models of body parts, including 108 representations of uteri (LaGall 1988). There were also medical tools found in the Tiber, so the two types of artefacts might have been deposited for a similar purpose. Although it is thought that the practice of anatomical votive deposition went out of vogue in the first century BC, the instruments might date to a later period, so perhaps the instrument deposition was a continuation of the practice. Anatomical votives continued to be deposited in the provinces of Gaul after the first century BC. There are large numbers of votive body part representations from Puy-de-Dôme with a yield of over 3,000 objects, while over 1,000 came from the head of the Seine (Deyts 1988). If shoes, helmets and jewellery, all of which are associated with the body and a particular person, along with votive representations of body parts were found in river deposits, than it is likely that medical tools could have contained a similar significance, allowing patients and doctors to ask or thank a deity for medical assistance through a process of ritual offering. The variety of these deposits could demonstrate a range of practices with different intentions. The single instruments could act more as personal offerings as a way

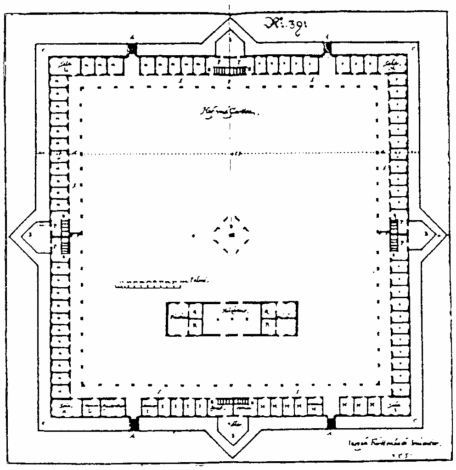
of asking or thanking a deity for individual help, whilst the cylindrical kits might have been more closely associated with mortuary ritual.

These examples provide some information of how archaeological remains of medical tools can provide us with further information about medicine in the past and demonstrate how practices differed and that tools can have multiple functions. Another area that archaeology has contributed to is the identification of Roman hospital buildings, which, as will be shown, is more difficult than previously understood by archaeologists.

VALETUDINARIA

In spite of the fact that many people use the identification of hospital buildings to support their interpretations of medical care being uniform in the Roman army (e.g. Davies 1989 (1970a): 221-4, Jackson 1988: 134-6; Salazar 2000: 81; Wilmanns 1995: 103-16) there is a need to assess whether there is sufficient archaeological evidence to sustain the interpretation of these structures as *valetudinaria*. This issue is argued more thoroughly in Baker (2002a and 2004a), but will be presented briefly here, as it shows why it is important to sometimes return to earlier archaeological interpretations. The field of study advances and sometimes with more evidence and changes in methodology original interpretations are no longer valid. This issue is raised because the identification of the Roman military hospital was made at the beginning of the 20th century and has been accepted without question since that time. Over the last century or so there have been numerous archaeological excavations of so-called hospitals in Roman fortifications, but the interpretation of these structures continues to be made in the same manner, regardless of new methods and theories.

There is no question that *valetudinaria* did exist in some legionary and auxiliary fortifications; they are sometimes, though rarely, mentioned on inscriptions and in other literary sources. Archaeologically, the first Roman military *valetudinarium* to be identified was that at the legionary fortress of Neuss, located on the lower Rhine (Koenen 1904: 180-2). Koenen identified the building as a *valetudinarium* because it contained a room with ten probes, and four scalpels were found in other rooms of the structure. Besides the instruments, the layout - a building with a number of small rooms, or wards, divided by small hallways that would aid in keeping the rooms quiet - was similar to the plan of German civilian and military hospitals of the 17th, 18th and 19th centuries (Jettner 1966: 82, 144-5), and this would have influenced his understanding of how a hospital should be arranged. Following his naming of the building, others with a similar design were accepted as *valetudinaria* without question. These are not the only structures in fortifications to have a courtyard plan. For example there have been arguments over whether the courtyard building at Corbridge was a *valetudinarium*, *fabrica* or storage buildings (Hanson 1979; Johnson 1983:



Plan of a 17th century hospital or poor-house from Germany. After Jettner 1966: Fig. 37.

163, note 152). Thus, the inclination to accept the identification of a building as a *valetudinarium* on the basis of four scalpels and one room with medical instruments (all of which can serve non-medical functions), and a possible anachronistic preconception of how a hospital should be arranged, indicates that there is a need to re-examine the evidence to see if the identification of this building type is secure, or if it was and is based on a tenuous argument.

The literary evidence unfortunately provides us with little explanation about how *valetudinaria* were expected to appear. Hyginus is the only writer from the Roman period who provides us with information that *valetudinaria* were to be a part of every marching camp at least at the time he was writing in the late 1st century, and this expectation is carried over by scholars for the construction of *valetudinaria* in permanent fortifications (Johnson 1983; Press 1986). Questions are raised about the identification of *valetudinaria* in auxiliary forts, but never in legionary fortifications (Johnson 1983: 163-4) because there is a strict expectation that they should be of a similar and easily recognisable plan. Buildings of comparable plan appear in all fortifications, but perhaps there is too much of an expectation that they were to all serve the same function. Since the buildings identified as *valetudinaria* in auxiliary forts are not of the same plan, more questions are raised about their existence than in legionary fortifications. An inscription from Mantissa Addendorum, occupied by a second cohort of *equites*, at Stojnik in Serbia has the word *valetudinarium* inscribed on it. Sadly the provenance of the inscription is not noted. Had the inscription been associated with a particular building, perhaps the structure could have provided an understanding about the possible layout of hospital buildings. A tablet from the fort of Vindolanda mentions the word *valetudinarium* on it along with references to workers in the *fabrica* (workshop). Since the text is damaged there is no indication as to whether the word *valetudinarium* is associated with those who built it, worked in it, or made tools, such as instruments, for it, but what it seems to do is provide a possible link with the *fabrica* (Bowman and Thomas 1994: 155).

Hyginus provides us with a slightly better description of the location of the *valetudinarium* in the fortification in his *Liber de Munitionibus Castrorum*. According to Hyginus (4), the *valetudinarium* was to be constructed beyond the *praetorium*, or the commanding officer's private quarters. As a means of keeping the building quiet, he suggested that the *veterinarium* and the *fabrica* be constructed about 70 Roman feet away from the *valetudinarium* to prevent noise from entering the building. It is often assumed that his suggestion for the location of the building is followed (e.g. von Petrikovitz 1975: 98), but when comparing fortifications of both the legionary and auxiliary units it becomes immediately apparent that each has a different arrangement of buildings, and the buildings that have been identified as *valetudinaria* are not always located in the area that Hyginus suggests. Sometimes they are located closer to the *fabrica* and the barracks, which might have been rather loud places at certain times during the day or night with soldiers' movements. Of course Hyginus was discussing the location of areas in temporary camps mainly made of tents so things might have been different depending upon the materials used in the construction of buildings in permanent fortifications.

Other primary historical sources that discuss the placement of wounded and ill soldiers on Roman military campaigns have been used by modern medical historians to support the existence of *valetudinaria* (e.g. Davies 1989: 221-2; Nutton 1969: 262-3, 1995: 49-51; Scarborough 1976: 78-9). Nutton believes that the *valetudinarium* was

based on a group of tents (1995: 49). When the Latin or Greek is examined carefully it becomes clear that the meanings of some historical statements might have been over-interpreted, as the sources relate to soldiers on campaign, not in permanent fortifications. One example of a historical source that is interpreted by Davies to be evidence of a *valetudinarium* is from Hadrian's biography, where a statement is made about how he would visit the sick in their quarters: "*Aegros milites in hospitiis suis videret"* (SHA *Hadr.* 10. 3). It is important to point out from this passage that Hadrian visited the sick in the *hospitium,* rather than in a *valetudinarium*. *Hospitium* is similar in meaning to the Greek word ξενοδοχεῖον and can be translated to mean a place for foreigners to stay, or a place to receive hospitality. Thus the Latin indicates that the sick and wounded were not necessarily placed in a *valetudinarium* for treatment or recuperation, but perhaps in another part of a building, or in a separate area of the campaign fortification.

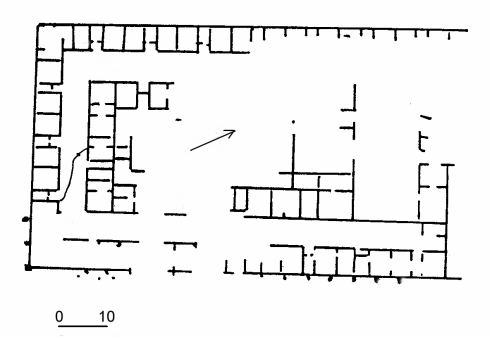
The biography of Severus Alexander (SHA *Severus* Alexander 47. 2) also describes him visiting the sick in their tents: "*aegrotantes ipse visitavit per tentoria milites"*. Since the writer uses the word for tent (*tentoria*), rather than *valetudinarium*, the suggestion is that the soldiers were placed in their tents, but whether this is meant to be specific tents for the sick is again not clear. Simply because he visits the sick and wounded in their tents does not automatically indicate a separate area, or set of tents. It is possible that the sick were placed with others, healthy or wounded, in their ranks. As the plural for tents is used it might imply a single group of tents used as a *valetudinarium*. There is a further suggestion that the soldiers were placed in their regular tents from Tacitus. He says that in the same tents some nursed the wounds of brothers, others of relatives: "*Isdem tentoriis alii fratrum, alii propinquorum volnera fovebant"* (*Hist*. 2. 45). From these three statements it is difficult to say if *valetudinaria* were set up during all military campaigns, only a few, or if they were set up at all.

A comparison of descriptions of civilian *valetudinaria* could be useful; unfortunately, however, descriptions of civilian *valetudinaria* are vaguer than those with the army. Celsus is the only Roman writer who mentions *valetudinaria* outside a military context and comments that the larger the building the less treatment there was made available to the people by the person in charge of running the structure (Proemium 65). This statement in itself indicates that such structures did exist. There is another suggestion by Harig that there might have been *Tabernae Medicae* (1971: 185-7; Jackson 1988: 65), or basically a shop where one could receive treatment. Galen also mentions visiting patients in their own homes; though it has been argued by Horstmannshoff that he did this mainly for the wealthy (1995: 84-5, 91). The civilian evidence points to a number of possibilities for people to receive treatment, suggesting that there may not have been one specific place for civilians to have health care offered to them and this should be kept in mind when the archaeological material is considered for the Roman military.

STRUCTURAL EVIDENCE

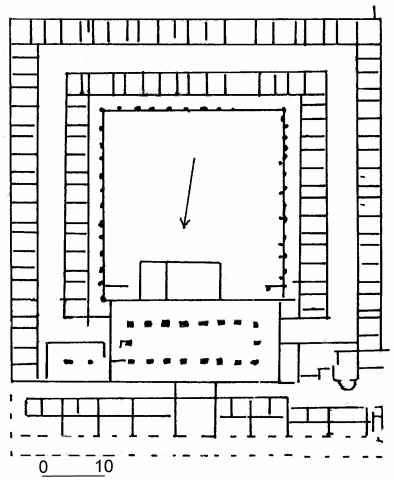
To add to our understanding of *valetudinaria*, the archaeological evidence for the structures needs to be considered in detail. The general layout of the structures identified were similar to one another; however even these vary from one fortification to another in terms of their size and the detail of their plan. Generally, the structures are based on a

rectangular plan constructed around a central courtyard (i.e. Jackson 1988: 136-7; Majno 1975: 382-96; Nutton 1969: 262-3; von Petrikovitz 1975: 88; Salazar 2000: 81; Scarborough 1976: 68 Wilmanns 1995: 104-5). The buildings in legionary fortresses had a courtyard that was surrounded on three sides by an inner row of small rooms, or 'wards'. The inner ring of rooms faced onto a hallway that was surrounded on three sides by an outer ring of wards. Each ward consisted of two rooms divided by a small hall, each of the two rooms opened onto the small hall, rather than onto the larger central hall. The rectangular plan described is more commonly found in the legionary fortresses; smaller versions of the rectangular plan surrounding a courtyard are seen in some auxiliary forts, but with only one ring of rooms surrounding the courtyard. Another plan that has been identified as a *valetudinarium* for auxiliary forts is a rectangular structure with a central hall surrounded on four sides by a single row of small rooms. The front of the structure is understood to be the area where the reception room, operating theatres, kitchens and rooms with a religious function were placed. These rooms were identified on understandings of rooms incorporated into hospitals in the 19th century. Salazar also notes that there is not enough evidence for operating theatres within *valetudinaria*; and rightly points out that the Greeks and Romans might have had different ideas about 'common sense' arrangements (2000: 70, 81-2).



Plan of 'hospital' at Neuss. After Johnson 1983: Fig. 160.

Legionary buildings that have been identified as valetudinaria are found in Inchtuthil, Caerleon, Vetera I and II, Haltern, Neuss, Bonn, Vindonissa, Carnuntum and Lotschitz and Novae. There are also some argued to be in the fortresses at Chester, Vindobona, Lauriacum, Regensburg and Aquincum, but these have even fewer structural remains for their identification to be relied upon with any certainty. In auxiliary forts so-called *valetudinaria* have been identified at Housesteads, Benwell, Pen Llystyn, Wallsend, Valkenburg, Oberstimm, Wiesbaden, and Künzing. For a detailed description of these see Baker (2004a)

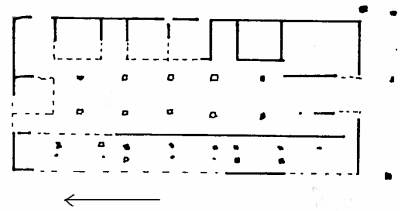


Plan of 'hospital' at Vetera I. After Johnson 1983: Fig. 117

An examination of the *valetudinaria* demonstrated notable variations between each structure in terms of plan and location. The size of the legionary structures ranges from 73.0 x 58.4 metres at Vetera I to 123.0 x 68.0 metres at Lotschitz. The central hall-style buildings identified as *valetudinaria* located in auxiliary forts range from 18.0 by 13.0 metres at Oberstimm to 35.0 by 12.0 metres at Valkenburg, and the courtyard style structures in auxiliary forts range from 30.0 by 22.0 metres at Housesteads to 24.7 by 22.5 metres at Benwell. Moreover, many buildings have only been partially excavated, and the extent of the rest of the structure is

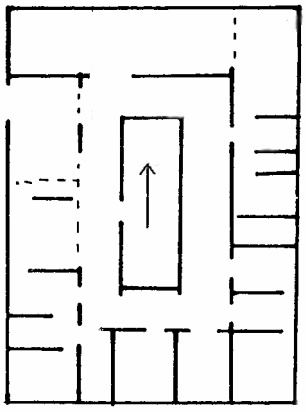
speculative. If the buildings are *valetudinaria* then they were not constructed on a standard scale.

The building that has been identified as the *valetudinarium* was not always found in the area of the fortification that Hyginus recommends, but was constructed next to different buildings, such as barracks, *fabrica, principia, praetoria* and granaries. If, on the contrary, Hyginus was followed then the plan of the *valetudinarium* varies because not all of the buildings located behind the commanding officers' houses are of the same design.



Plan of the 'hospital' at Künzing. After Johnson 1983: Fig. 121

The different kinds of room within a structure are also used to determine the purpose of the building. Von Petrikovitz (1975) and Press (1988) believe that all *valetudinaria* had baths, but there is certainly not enough evidence from the structural remains to support this assumption. The *valetudinarium* in Vetera I had a bath and some rooms in Neuss and Carnuntum had a hypocaust system, which are often associated with bathing, but could have been used to heat rooms. Warm rooms would certainly have been sensible for the sick and wounded soldiers, as well as the provision of their own baths, preventing the need for them to leave the comfort and warmth of the *valetudinarium*. Bathing was a means of treatment in Roman times and some soldiers were even sent to baths for recovery, such as at Baden Baden in Germania Superior and Aquae Sulis (Bath) in Britannia (Doppler 1970/71: 26). It is possible that some *valetudinaria* did have private baths for the sick, but it is also possible that if baths were not provided in the structure then the sick were either sponge bathed, sent to the camp bath, or might not have been bathed, depending on the beliefs of the unit towards the care of the ill and the disease's association with cleanliness. Moreover, heating might only have been provided depending on the environmental understandings of the illness and its cure, as discussed previously with building constructions.



Plan of the 'hospital' at Housesteads. After Johnson 1983: Fig. 121

It is also expected that latrines were placed in all of the so-called fortification *valetudinaria* (e.g. von Petrikovitz 1975: 101). Again this assumption is not fully supported by the archaeological remains. There was a possible latrine found at Housesteads and one at Wallsend. Neuss, Vindonissa and Lauriacum had drains running out of the structures, but their intended purpose has only been assumed to be for latrines. There are no archaeological remains of toilets in any of these structures. The placement of a latrine in *valetudinaria* would make sense; however the sick soldiers might have been encouraged to use the camp latrines as a means of obtaining fresh air when they walked to the structure, or if they could not, perhaps 'bed-pans' were used.

Operating theatres are integral to any modern hospital, and so there is another expectation the Roman *valetudinaria* were to have such rooms as well (Schultz 1934). The only indication we have about the rooms in which doctors had to work is from

Celsus, who recommends a well-lit area to perform a cataract operation (7. 7. 14C). Quite often it is suggested that the patient sat rather than lay down (e.g. Celsus 7. 7. 14C). Archaeologists believe that the physical remains of rooms that protrude into the courtyard such as at Neuss and Vetera I were operating theatres, because it is believed they would have had brighter light and fresher air (von Petrikovitz 1975: 101). In comparison, modern operating theatres need room for an operating table, electronic equipment, a team of surgeons and nurses, large lamps and tanks for anaesthetic gases. No Roman operating theatre, if they existed, would have needed room to accommodate the same number of items that are used in modern surgery. This might suggest that there was not much call for large operating rooms to accommodate a surgery bed. We can assume that in some cases the doctors performed surgery in separate rooms from the places the soldiers were resting, but it might have depended on the type of treatment that was being offered. Thus, the anachronistic expectations of operating theatres having existed and their having to be large rooms, is imposed on Roman *valetudinaria*.

The final two rooms that are mentioned repeatedly in the descriptions of *valetudinaria* are the possible kitchen and cult room. Some of the structures have hearths within them that were originally suggested to have been used by doctors to sterilise their instruments (Schultz 1934: 55). However, as it became clear that sterilisation was not practised by the Romans the hearths were then argued to have been used as a component in kitchens, again one the 'common sense' arguments because modern hospitals always have cooking facilities. Kitchens in Roman fortifications are not widely known of because it seems that most soldiers were expected to cook their own meals. It may be that the soldiers cooked for their sick comrades in their barracks, rather than there being kitchen staff in the *valetudinaria*. Hearths are often found throughout many buildings and could have had a variety of functions, such as cooking, heating, craft activities and so forth. Without secure contextual records of the archaeological finds from rooms with hearths it is impossible to say what their intended function or functions were.

Rooms claimed to have a sacred or religious function are also thought to have been part of all the *valetudinaria*, but evidence is lacking from most places. A small shrine dedicated to the healing deities of Aesculapius, Hygia, Jupiter and Minerva was uncovered at Novae (Dyzcek 1995: 201-2). A building that has altars dedicated to gods of health need not necessarily be a *valetudinarium*, it could have had another function, perhaps as places where 'clubs' or religious societies would meet (Johnson 1983: 30, 111).

CULTURAL VIEWS OF SPACE

The finer details of the *valetudinarium* arrangements are described as if the buildings were modern hospitals. The sleeping arrangements are discussed by Majno (1975: 387) and von Petrikovitz (1975: 101), who state that there was probably space for four or five people, each having their own beds. To the modern reader, this seems perfectly reasonable; nonetheless we know very little about the sleeping arrangements of the Romans. When looking at other cultures it becomes clear that the one person or couple per bed is not always the norm. The Pennsylvania Amish practice bundling, whereby they use their beds as places for discussion and courting in the winter months. Since the Amish do not have heating in their houses they find that it is more comfortable and

practical to invite a guest to sit under the covers of their beds for warmth. In order to avoid possible 'temptation', a length of wood known as a bundling board is placed down the centre of the bed separating the two occupants. In the Inns of colonial America an overnight visitor paid for a space rather than a room and might have had to sleep in the same bed with a stranger, or even on the floor. These examples demonstrate that even in modern and post-medieval times the bed and sleeping arrangements take on culturally determined forms.

One could argue that this does not consider the sleeping arrangements of the ill; however, medieval paintings of hospitals reveal that there was not always a single person in one bed. It has been argued that the scenes of a male and female in the same bed were spouses; however, this argument does not explain paintings with three people placed in the same bed or people of the same sex (Furniss 1970: 3). It is possible, therefore, that Roman soldiers might have had different sleeping arrangements while they were sick or even when healthy. From the Hippocratic writings (Decorum 15) we learn that a patient was placed in rooms according to the environment, but we do not know if the person was at home, in a *valetudinarium*, or in a room or bed alone.

The anthropological study of proxemics reveals that people define their space and environmental surroundings according to their cultural norms (Argyle 1988: 184; Deetz 1977: 25). In certain cultures people will stand closer to one another whilst speaking to people than in other cultures. This space does not only affect the manner people use non-verbal communication with their body, but also the way they organise their architectural arrangements as well as their domestic and office furnishings (Argyle 1988: 185-7). Although this can be done more easily through modern anthropological examinations, there are means of questioning cultural understandings of space through archaeological studies. To do so, contextual examinations of artefacts are imperative for understanding how a society understood their architectural and environmental surroundings (Deetz 1977: 25).

There has been one contextual study of the finds from a so-called *valetudinarium*, that at Novae. Although Dyzcek (1995) refers to the building as a *valetudinarium*, if we eliminate the identification of the building and simply look at the arrangement of finds, some interesting patterns begin to appear. Many metal fragments - pieces of armour and a bronze helmet, phalerae, and iron spearhead - along with many fragments of chain were found in the so-called bedrooms of the structure. He also says that in these rooms were also found items possibly related to use in the *valetudinarium*, such as lamps, vessel handles and fibulae (Dyzcek 1995: 200). Yet, it is not explained why these are to be specifically related to *valetudinaria*. Lamps for example were used in most buildings. Being part of normal domestic equipment, fibulae and vessel handles are also found in many areas of fortifications. The small vestibules between the bedrooms had types of tableware and butchered animal bones including a dolphin's rib (Dyzcek 1995: 200-2). Room 48 of the structure had a store of broken probes and physicians' caskets (Dyzcek 1995: 202), possibly indicating that health care was offered to the soldiers in this particular room, rather than in the entire building, or it might also indicate storage or deposition. Room 35 was thought to be the room were patients were examined, simply because fragments of two physicians' caskets and a spatula probe were found in it (Dyzcek 1995: 202-3). If one looks at the finds there seem to be specific places where items were kept, or discarded (there is no discussion on whether these finds were from

the time of the building's use, abandonment or destruction). Yet, the items tend not to tell us whether the building was a *valetudinarium* because, in addition to the broken instruments, the great variety of other items could relate to a range of functions and other activities, not associated with medicine, and it is possible that the tools were used for other purposes.

With the exception of the instruments from Neuss, the contextual evidence for instruments found within fortifications in Germania Inferior has been poorly recorded. The instruments from Neuss are of interest because a number of probes and forceps were found in the so-called *valetudinarium*; four scalpels were also found in the building, although in other rooms. The majority of these came from a single room, room 51, tending to suggest some form of storage rather than a surgical area, especially since they were mainly probes. Nonetheless this structure was not the only building to have yielded instruments. The baths at Neuss had a few instruments as well. The *principia* has seven instruments pointing to the possibility that people were either receiving treatment here, grooming themselves in public, or the instruments might have had another function. Ten instruments were found in the barracks, and it is therefore possible that the fortress doctor could have travelled to the rooms. Eleven instruments were found in other buildings throughout the fortress. Thus the majority of the instruments do not come from the so-called *valetudinarium*, which might indicate that soldiers were able to receive treatment in a variety of places. Of course, the location of the finds need not be a direct reflection of where treatment was taking place – their distribution only reflects a place of loss or final deposition. In Germania Superior the fort at Ladenburg has surgical instruments from the bath, located outside of it; however because it is in such close proximity to the fort it was probably used by the soldiers. .

Perhaps in certain places there was no *valetudinarium,* so the fort doctor was provided with a room or set of rooms to work from wherever there was available space in the fortification. This is implied by the instruments found in baths, and the single room of instruments in the *valetudinaria* at Neuss and Novae. The instruments are probes that could have been used for personal hygiene as well, indicating that soldiers might have been grooming themselves whilst on duty.

As a final note of caution, although it is important to look at the finds from each structure to attempt to determine its function, it must be remembered that artefacts can be moved from one place to another and are not necessarily found in the locations where they were used or originally deposited (Schiffer 1987). For example certain buildings might have gone out of use, and the objects in them could have been moved to another structure. The obsolete building might then have been used as a place to deposit rubbish brought in from elsewhere. Roman archaeologists sometimes assume that artefacts occur in the same place that they were used, implying they were dropped as 'primary' refuse. Thus by looking at the find spots of the instruments it is rather difficult to give a precise idea about where they were intended to be used. The one exception may be with bath buildings where many instruments have been found. The spread of instrument find spots across forts does indicate that the *valetudinaria* cannot be determined from finds alone as the excavator of Neuss and archaeologists who followed have tended to uncritically accept.

Thus, this brief introduction shows the necessity of considering the archaeological material beyond the comparison with classical medical texts. Much can be said about

how people understood and used medical tools as well as how they may have perceived places of healing.

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