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# CONSERVATION OF THE CARLISLE ROMAN WRITING TABLETS

Jennifer Jones, HBMC Conservator

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# CONSERVATION OF THE CARLISLE ROMAN WRITING TABLETS

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## SUMMARY

Excavations in Carlisle produced many waterlogged Roman stylus and ink writing tablet fragments. The stylus tablets were initially treated using the IMS/ether/resin method, and later with a PEG pre-treatment, followed by freeze-drying. The ink fragments were treated using IMS/ether/resin. They were viewed using infra-red light to detect ink writing, and were photographed using infra-red film.

## Introduction

Between 1979 and 1984, large-scale rescue excavations were carried out by the Carlisle Archaeological Unit on several sites in Carlisle city centre, in advance of redevelopment work. These excavations encountered extensive waterlogged layers, mainly dating to the first and second centuries AD. They produced for conservation a very large number of organic artefacts. Objects of wet bone, jet, shale and amber were excavated, along with leather shoe, tent and garment fragments, many large and small wooden artefacts and structural timbers. There was also a considerable number of Roman writing tablet fragments.

## Stylus and Ink writing tablets.

Two different sorts of writing tablet were in use in the Roman period, and examples of both sorts were found in the Carlisle excavations :-

a) **Ink tablets.**

These were made from slivers of very thin wood (0.5-1mm thick), and were oblong in shape. Though usually fragmentary when excavated, examples up to 20x9cm have been found at the Vindolanda Roman fort site. (Bowman and Thomas 1983) The wood used has a smooth, close-grained texture, and the surface is written on directly, using ink, sometimes on both sides. The writing may follow the grain of the wood, or it may be at right-angles to it. As the ink was not removable, we may suppose that this sort of tablet was used only once.

b) **Stylus tablets.**

Stylus tablets are flat rectangles of straight-grained wood, up to around 15x6cm, of varying thickness, those from Carlisle being about 5mm. They have a shallow recess cut into one face, leaving a small lip around the edge. To create the writing surface, wax was poured into this recess. It was then written on using the pointed end of a stylus. These were usually made of metal, and examples of such styli have been found in the Carlisle excavations. In contrast to the ink tablets, these stylus tablets were re-usable, as the wax surface could be cleaned using the flat end of the metal stylus as an eraser. Alternatively, fresh wax could be poured into the wooden recess.

## Excavation and Storage of the tablets.

Writing tablet fragments were discovered on all the major sites excavated in Carlisle during the '79-'84 period : - Annetwell St, Castle St, and a group of sites known as The Lanes.

Annetwell St and Castle St are adjoining sites, with Annetwell St just inside, and Castle St just outside the known boundaries of the Roman fort. The Lanes sites were some distance away, and the features excavated there have been interpreted as the residence of a Roman official.( McCarthy 1982 )

The stylus tablets, when excavated, were reasonably robust, and could be safely handled. They were found on all the sites excavated, but the greatest numbers came from the Annetwell and Castle Street

sites. They were treated on site in the same manner as other small wooden artefacts, and were placed, uncleaned, inside three sealed polythene bags, and stored at 4 degrees C.

The fragility and size of the ink writing tablet fragments made their excavation and storage more difficult. The largest concentration of the ink fragments came from a single feature on the Annetwell St site, thought to be a well or latrine. Fragments were scattered through this feature, and unfortunately it seems likely that the tablets were deliberately broken up before being disposed of. Many of the fragments were very small, some being less than 1cm square. The excavation of the writing tablets fragments in this feature was done in centimetre spits.

After excavation, the uncleaned fragments were placed between strips of polythene, in several layers, and stored in sealed polythene boxes in the refrigerator to await conservation. In this way, the layers could be lifted out of the boxes without touching the wood. Initially, damp, acid-free tissue had also been used in the boxes, covering the wood fragments. This rapidly became black and mouldy, and was removed. It was very important to keep the fragments damp during storage by spraying them regularly with distilled water, as being so thin (around 1mm), they could dry out very quickly.

## Cleaning and Examination.

Cleaning and examination of the stylus tablets was relatively straight-forward. First, they were visually examined, mainly to check for the remains of wax in the recessed writing area. Only one of the tablets was found to still contain traces of wax, and this appeared as a black deposit on the wood. Samples of this wax were taken, and the results are awaited. As these tablets were not particularly fragile, it was considered safe to wash them without risk of damage. This was done under running water, with a soft brush, the tablet supported on net stretched over a wooden frame.

As the wax had disappeared from the majority of the tablets, the only traces of writing which could be found were where the stylus point had gone right through the wax layer, and had scratched the underlying wood. This often results in a palimpsest of letters and word fragments, which serves to confirm that the tablet has been re-used several times, but is usually indecipherable.

Occasionally, there are two or three consecutive words visible, which could be useful to the epigrapher. Both sides of the cleaned tablets were examined visually, using a raking light to enhance the letters. The backs of the stylus tablets can produce more epigraphical evidence than the fronts. It seems to have been common practice when sending a stylus tablet to scratch the name and 'address' of the recipient on the back of the tablet. This was often done in large, bold letters. The tablets examined produced two examples of personal names on the reverse, and one also had the words "In Britannia" added, indicating presumably, that it had been sent from outside the province. Some of the tablets, however, appeared to be blank on both sides.

After cleaning, a small sample of the wood was taken from each tablet for later identification.

The cleaning and examination of the ink writing tablet fragments was more complex. Ink writing was immediately visible on some of the Carlisle fragments, but it was known from work done on ink tablets from the Vindolanda Roman fort in Northumberland, that tablets which appear blank to the naked eye, can have writing which becomes visible when exposed to infra-red light.
( Bowman and Thomas 1983 )

The Dept. of Palaeography at Durham University has a Video Spectral Comparator ( Videscan ), for viewing documents under ultra-violet or infra-red light, and this facility was used to examine the ink writing tablets. The Videscan has a variety of infra-red and ultra-violet filters, plus contrast and brightness controls, to enhance the definition and clarity of the visible writing. It is also possible to enlarge particular fragments on the screen for closer examination, and to rotate the image if the writing appears upside down. As the process involved simply placing the fragments, supported on small sheets of glass, on a platform beneath the machine, there was little risk of damage.

As there were over 500 fragments of ink writing tablet from the Carlisle excavations, it was initially intended to use the Videscan machine to separate out those which had visible traces of writing, before the cleaning process. It was hoped that the infra-red light would be able to pass through the thin layer of dirt on the surface of the fragments, but this proved to be impossible. Therefore, all 500 fragments had to be cleaned before they could be checked for writing.

The obvious danger in cleaning the ink fragments lay in unintentionally removing the ink during the washing process. Firstly, the fragments were examined microscopically, to remove as much dirt as possible mechanically, without using water. It became apparent upon close examination, that the remaining ink had actually sunk into the wood, and was no longer standing proud of the surface. It would therefore be more difficult to accidentally remove the ink, even where it could not be seen without the use of an infra-red light source.

When as much of the obscuring dirt as possible had been removed mechanically, the fragments were washed, using distilled water and cotton wool swabs or soft brushes. Both the mechanical cleaning and the washing processes were carried out with the fragments supported on a small piece of glass.

## Wood Identification

Samples had already been taken from both sorts of tablet for identification. The stylus tablets were found to be made invariably from *Abies alba* (silver fir). As this tree was not native to Britain in the Roman period, it would seem that either the Romans were importing ready made tablets, or were bringing in the wood to manufacture them.

Identification work on samples from a range of other wooden artefacts from Carlisle has found several objects other than writing tablets which were made from *Abies*, such as parts of buckets or barrels.

*Abies* is particularly useful for making writing tablets as it has a long straight grain, which can be utilised in the tablet manufacture.

It was more difficult to identify the wood used for the ink tablets. As they were so small and thin, it was hard to cut all three sections necessary for a positive identification. Five samples were successfully identified as *Alnus* (alder).

## CONSERVATION

Several conservation options were considered for the writing tablets. The stylus tablets were reasonably robust, and could have received the same treatment given to other small wooden artefacts in the Lab at the time. That is, they could have been treated using the acetone/rosin method or with PEG bulking.

The ink tablets were much more fragile, and it seemed likely that the thinness of the wood would lead to warping and distortion of the shape if treated inappropriately. There was also the consideration of the final colour of the wood, which should not be too dark, in order to provide sufficient contrast with the ink writing, where visible. This consideration was also important for the stylus tablets, if they were to resemble the colour of natural wood as closely as possible after treatment.

Ink tablet fragments from early excavations at the Vindolanda Roman fort had been treated at the British Museum by Susan Blackshaw, using a method devised by Dr A.Werner in the Research Laboratory, involving industrial methylated spirit, ether and dammar resin. ( Blackshaw 1974 )

It was decided to follow this method of conservation, initially for the stylus tablets, which were required first by the excavator. The washed tablets were soaked in 2 changes of industrial methylated spirit for 7 days at a time. This was followed by 3 changes of ether, for 4 days at a time. They were then dipped briefly in a 10% solution of dammar resin in ether, and allowed to dry in the fume cupboard.

Results from this method of conservation were acceptable in terms of the condition of the wood, and no warping and little shrinkage occurred. However, the wood was still quite soft, and it was felt that a little more strength was needed, and also that the finished colour should be darker. Consequently, the next batch of stylus tablets were dipped into a 15% solution of colophony resin in ether, after being removed from the final ether bath. The wood was a little harder and more robust with this treatment, and the darker resin gave a better colour, which provided more contrast, and enabled any scratched letters to be seen more clearly.

The ether/colophony treatment was used successfully on several batches of stylus tablets, until Durham Archaeology Dept. acquired a freeze-drying unit. It was then decided to treat the stylus tablets by freeze-drying. They were pre-treated in the same manner as other small wooden artefacts, with a solution of 10% polyethylene glycol 400, followed by 30% PEG 4000 added over a period of several weeks. This pre-treatment period varied depending on the number of pieces of wood involved each time, but was between 8 and 10 weeks. The tablets were then frozen and freeze-dried. Results using this method were very pleasing. The wood was robust, and had a good, even colour. Any surface detail was clearly visible.

Conservation of the ink tablets also followed the ether/colophony method. The de-watering processes were successful, but problems were encountered at the consolidation stage. Firstly, after the consolidant had been applied, it was very difficult to find a way of drying the fragments without producing an uneven surface colour. Secondly, it was found that application of the consolidant solution by dipping alone did not produce a sufficient intensity of surface colour.

The problem with uneven drying was eventually addressed by leaning the dipped fragments around the circumference of an upturned watch glass, so that as much of their surface area as possible was exposed to the air at any one time. They were also moved frequently. This necessitated that the fragments were consolidated in very small batches, but as ether was being used the drying times involved were very small. It was usually less than one minute before the fragments could be safely left in one position.

To produce a more intense surface colour, it was found that dipping of the fragments, followed by application by brush of a further layer of consolidant was necessary. A second dipping, as opposed to application of the resin by brush, did not give such good results.

It was felt that the ether/resin method gave good results for the ink tablets. However, working with ether has its disadvantages, notably that of finding a suitable container in which to soak the fragments. Polythene boxes were used, because of their air-tight seals, but the ether gradually caused the polythene to sag, and they could only be used for two or three batches of fragments before being replaced. Glass vessels would have been more suitable, but none could be obtained with air-tight seals.

Freeze-drying the ink fragments would have been a possibility, but there was not time for adequate research into the process. Experiments were conducted placing the pre-treated fragments in the freeze-dryer between sheets of perspex or cardboard. Both methods resulted in a very uneven surface colour, though there was no warping of the wood.

## Examination/Photography

The completed stylus tablets were returned to the Carlisle Archaeological Unit, and then sent for interpretation to the epigrapher, Dr Roger Tomlin of Wolfson College, Oxford. The stylus tablets are worked on directly in the interpretation of the writing traces, using a raking light to best illuminate the scratches.

With the ink tablets, however, the epigrapher prefers to work from photographs, sometimes enlarged. Infra-red photography is obviously necessary for those fragments whose writing is only visible under an infra-red light source, and it is also used to enhance writing which is already visible. From an epigraphical point of view, the use of photographs means that the fragments can easily be moved around to find possible joins between pieces, without fear of damaging the originals.

Before the photography could be done, it had to be established which of the 500+ pieces bore traces of writing. The groups of conserved fragments were again examined using the Videscan machine, this time successfully. I was assisted in this task by Dr David Thomas of the Palaeography Department, who had worked on the epigraphy of the Vindolanda material. All the fragments which had any traces of writing were selected for photography. Approximately one third of the pieces were found to have writing traces.

These pieces were arranged in groups of 2 or 4, depending on size, between A5-sized sheets of glass covered with acid-free tissue paper. The spacing of the tablets was important, so that individual portions of the negative could be enlarged if required.

The infra-red photography was carried out by Miss Alison Rutherford at the Audio Visual Centre of Newcastle University Medical School. The resulting prints were passed on to the epigrapher, who will use them to produce his report.

## Storage

It was found that the way the fragments were arranged for photography was a suitable way to store them in the longer term. They are kept flat, and the tissue paper cushions them from damage. The only problem with this method is in finding a way of holding the sheets of glass in place. Two elastic bands placed at right angles to each other around the pieces of glass is the current solution. However, this cannot be permanent, as rubber bands very quickly become degraded and break. In case fragments should slip from between the sheets of glass, they are put into sealed, pierced plastic bags. The blank tablet fragments are stored similarly, using larger sheets of glass.

It is likely that some of the stylus tablets, and perhaps one or two of the larger ink fragments will eventually be displayed in the new extension to Tullie House Museum in Carlisle, which has been constructed directly over the site which produced them.

J.Jones
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