JOHN WATERER AND THE 'CUIR BOUILLI' CONFUSION

The history of leather objects has received relatively little attention, scholarly or otherwise. Leather was in many ways the plastic of former ages, ubiquitous, and extremely diverse in its use. Perhaps for this reason it is less prominent in our historical consciousness than more 'precious' materials. The result is that both the complexity of the means of treating leather and the diversity of its uses are not as well understood as they might be. My intent here is to add to what we know about historical leather working processes in an area where I have sufficient expertise to make a contribution.

The two categories of objects I am examining are fascinating and deserve to be better known. The issues that I am addressing are largely technical in nature. Some of these objects are the historical antecedents to my work with leather, which makes them of particular interest to me. For objects to attract and hold our attention we need to know something about them. Objects that transcend their time and place to speak to us purely on the basis of their visual elements are few. We can often only appreciate an artefact or read it as a marker for the culture that made it if we understand its intention (why was it made and for whom) and the process used to make it. Knowledge of technical information helps us to understand and evaluate the quality and particular character of an object. Is it well made? Are the processes used simple or complex? How well were they controlled? The answers to these questions help us to understand why an object looks as it does. They tell us about the makers and about the society for which it was made.

The term 'cuir bouilli' has been used to describe leather objects of very different visual styles, sophistication, surface treatment, function and method of construction. John Waterer, co-founder of the Museum of Leathercraft, more than anyone else, attempted to understand what the term meant and what objects are properly described by this term. As with much else in the history of leather we are in his debt for his wide ranging and pioneering research. However, he made a number of assumptions about this work that are misleading. This is hardly surprising. Much confusion surrounds 'cuir bouilli' because of the lack written documentation, and the fragmentary and unreliable nature of the information that survives. His assertion that the literal translation of the term 'cuir bouilli' as boiled leather is "meaningless"[1] will not stand scrutiny. The term needs to be understood as a label, a title, not a description of a process and as such it needs qualification and elaboration; however it is certainly not meaningless. Secondly, he identifies 'cuir bouilli' with forming processes and not with leather that has been hardened, which is, I believe, a more appropriate indicator. Boiling leads to shrinkage, which causes hardening.

Waterer excludes ornamented work (either stamped incised or repoussé), usually Italian, which had not been formed to any appreciable degree but is hardened. The same

1 John Waterer, Leather and the Warrior An account of the importance of leather to the fighting man from the time of the ancient Greeks to World War II, The Museum of Leathercraft, Northampton, p.62.

distinctive type of leather, similarly decorated, is also used to make dramatically formed hardened objects that he does identify as ‘cuir bouilli’. These decorated objects are hardened by stuffing the leather, not by taking it to shrinkage temperature.

Any definition of ‘cuir bouilli’ at this stage is going to be somewhat contingent but it seems to me using hardened leather as the common factor corresponds to the result of ‘boiling’ which involves heat, be it hot water resulting in shrinkage or hot fat or hot resin which harden by stuffing the leather. By equating ‘cuir bouilli’ with formed objects Waterer includes work that while firm and stable in form has not been hardened to the degree we see in objects that been taken to shrinkage temperature or stuffed. His definition, moreover, is based on a misperception of the processes used to make many of the objects he is discussing in that he does not allow they might be taken to shrinkage temperature.

It was this discrepancy between the literal meaning of the term and what Waterer thought it described that originally attracted me to the historical objects. I have now been working with heat processes for over 30 years and with ‘boiling’ water processes for 25 years. A great deal of what I know comes from figuring out how to use and control the effects of heat for my own work. While I have experimented with historical forms for my own interest, it is the heating processes themselves that have informed my work. [2]

Further confusion about 'cuir bouilli’ results from the fact that it has been used to refer to two very different types of work. 1) The bottles, blackjacks and bombards *(Figure 1)* of which the surviving examples are almost entirely of English origin and 2) the highly decorated sophisticated forms of the largely Italian scroll cases, missal cases *(Figure 2),* boxes, powder flasks and parade shields.

The former are formed then hardened using a hot water based process where at least some of the object, usually the outer surface, is heated to shrinkage temperature[3]. When the object cools it gets extremely hard and when it dries it is nearly impervious to water, and its shape will not be effected appreciably by rewetting it. This process is irreversible. There are a number of ways this surface hardening could have been achieved including immersing it

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[2] I have investigated what happens to the leather in boiling water in times ranging from a few seconds to several hours, considered the effects of the animal a hide comes from, the part of the hide, its thickness and the tannage (within vegetable tanned leathers), the effects of different heat sources and different approaches to controlling leather that has been taken to shrinkage temperature. In the early stages my investigations were wide ranging, a systematic cataloguing of what is happening without any preconceived idea of how it might be used or if it would be useful at all. In my investigation of historic objects I looked at various possible ways the objects could be formed and how forms could be maintained during shrinkage. I also attempted to reproduce some of the more unusual effects I saw. I also noted how what I did corresponded and differed from the historic objects. My experimental interest has been confined to water hardening processes. My own work was supplemented by incorporating an experimental approach to using heat in the teaching I did early on in my investigation of the boiling process.

3 Shrinkage temperature is the point at which the collagen fibres in the leather begin to contract in the presence of water.

Figure 1 Bombard, Deutsches Ledermuseum.

in boiling water and baking it in an oven. These objects are usually japanned[4]. I will discuss these possible methods later on with reference to particular objects.

A water hardening process could not have produced the second body of work because the shrinkage it causes would severely distort or completely eliminate the extremely detailed decoration. This work also has a characteristic black colour, which in this highly decorated work tends to go right through the leather, unlike the bottles where the colour is a surface coating. The most likely process involves stuffing the leather with a material that hardens it. There are a few historic references to the use of oils or wax. Waterer correctly rejects oils as these are softening agents. He is also suspicious of wax because he thought it principally as a waterproofing agent. Wax could be used to stuff the leather as it has a reasonably high melting point (60 degrees C.) and it makes it stable at room temperature, and hardens the leather somewhat. However, this work is in fact harder than wax could make it. Stearic acid could be the hardening agent here. Of the acids derived from animal fats it has the longest molecular chain and this means that in the solid state it would be the hardest. It has a high melting point (it must be heated to 70 to 80 degrees C.) and so would maintain hardness at normal temperatures. The leather is immersed in the stearic acid, heated sufficiently to be in the liquid state. The leather must be thoroughly dry during this stuffing operation so the high temperature will not affect the its structure. The stearic acid gives leather the characteristic black colour shifting to

[4] Japanning is a finish (usually black) made of linseed oil and lamp black which is brushed on to the leather in layers and heated and gives the leather a smooth glossy surface.

brown when less of the material is present. This corresponds to what we see in this category of objects. Pine resin (pitch) is also a possibility.

Figure 2. Missal Case, French 15th or 16th century, Museum of Leathercraft

Neil MacGregor speculates that some of this work may be raw or only partly tanned hide, the latter being stuffed with pine pitch with lampblack added. This is certainly possible as both the interiors and exteriors of some scissor cases do have the translucent look of rawhide and works like the Florentine quiver *(figure 3)* in the Museum of Leathercraft also has a kind of translucence and is dark brown rather

Figure 3. Florentine Quiver (detail), late 15th century, Museum of Leathercraft (photo Neil MacGregor)

than black. Perhaps it is only partly tanned. The quiver had a tendency to get slightly tacky on its surface under the photographic lights. This is not a universal characteristic, examination of the powder flasks in both the Deutsches Ledermuseum and the Wallace Collection indicate that fully tanned leather was used for these objects and no tackiness materialized under similar conditions. It seems likely that the range of methods, materials and techniques used are quite varied and probably, in part, developed around the particular needs of each object and the materials available to the maker. For example, a recipe which consisted of rosin, yellow wax and lamp black found in DeGaurault, L'Art du Cordonnier, 1767 was used to make a hypothetical replica of a cuirass, with good results.

While this type of work is often formed into three dimensional objects *(figure 4),* it is also used to cover wooden forms as is the case with the container from the Deutsches Ledermuseum *(figure 5)* or the parade shield *(figure 6).* In these objects forming is less important than surface decoration and it does not have a structural function.

Waterer objected to the idea of wax stuffing because he could not figure out how to heat it sufficiently to be able to do any forming and this question would also apply to stearic acid or pine pitch. Claude Spiers (a leather chemist & one of the founders of the Museum of Leathercraft) felt Waterer was making too much of this and that such forming methods were still in use.[5]

5 John Waterer Papers, Museum of Leathercraft, Northampton, England, Claude Spiers Criticism of the section of the manuscript for leather and the Warrior on 'cuir bouilli'

Figure 4. Powder Flask, Italian, 16th century, Deutsches Ledermuseum

More problematic is how the surface decoration was accomplished. Gall (former director of the Deutsches Ledermuseum) suggests that the decoration was done in the usual way by wetting and then stamping etc. before any hardening[6].

6 Waterer Papers, Spiers

Figure 5. Container, wood covered with decorated leather, Milan 1550, Deutsches Ledermuseum

This is also problematic, since it would be difficult to cleanly remove residues of either stearate or pine pitch from the carved areas of these objects, and even more difficult to prevent it discolouring the white stuffing that was used for sophisticated repoussé (areas within the decoration were raised by packing a pocket in the leather with thread or similar material inserted through an awl hole hidden in an incised line). Consequently we have to consider that the decoration was done after the leather was stuffed. Stearic acid makes the leather water resistant. It seems likely that the leather would have to have been heated to soften it sufficiently for carving, tooling etc. if in fact the decoration and forming came after immersion in stearic acid. Such working methods, if correct, are lost. Despite the reservations about Gall's conclusion expressed above, careful application of hot stearic acid or other stuffing material after forming cannot be ruled out. Sorting out how these objects were made is not going to be easy particularly because of both the very high level of and range of skills involved in making them.

Figure 6. Parade Shield, wood covered with decorated leather, 16th century, Deutsches Ledermuseum

These are works of extraordinary artistry and technical virtuosity. The sixteenth century scroll case bearing the crest of the Duke of Modena and Ferrera from the collection of the Deutsches Ledermuseum *(figure 7)* combines virtuoso skills in surface decoration, forming and joining. The Italian powder flask from the same period *(figure 4)* achieves complex three dimensional forms that are at the very edge of the limits of leather's ability to be stretched and compressed, as well as incorporating beautiful tooled and carved decoration. To appreciate what these craftsmen have achieved one need only compare these works to the powder flask from the Museum of Leathercraft *(figure 8)* illustrated in Leather and the Warrior. This work is a copy from a later date, not sixteenth century Italian as Waterer claims[7]. The workmanship, while excellent, achieves only about two-thirds the depth of shape of the sixteenth century Italian powder flasks[8]. The level of artistry, technical complexity and virtuosity we see in the sixteenth century work will make finding out how it was made extremely difficult. However, testing to determine what this leather was stuffed with would at least make it possible to develop a hypothesis and test it.

If the Italian work represents a high point of refinement and technical skill, the bottles, black jacks and bombards present an equally curious and fascinating glimpse of

Figure 7. Scroll Case bearing the crest of the Duke of Modena and Ferrera, 1540, Deutsches Ledermuseum

7 Waterer, Leather and the Warrior, p.93.

8 There are two things that suggest this is a copy in addition to the differences in the form 1) the tops and spouts of the flask are metal this one is of wood. 2) The leather is still flexible where the nature of the form permits movement which indicates that the work is formed from vegetable tanned leather that has not been hardened by stuffing it.

Figure 8. Powder Flask (reproduction), Museum of Leathercraft

objects intended for every day use. Not the least curious thing about them is that the examples that survive are almost invariably from England where they continued to be made until the early nineteenth century. Much of what survives dates from the seventeenth century and later; however it seems likely they have a very long history. The mystery is why they persisted so long in England. Perhaps the temperate climate insured they did not quickly become less than pleasant to use. Apart from the question of why the English remained attached to what in hindsight seems a distinctly odd choice of drinking vessel, the fact that they were sometimes crude and common meant that their makers were willing to tolerate imperfections and distortions of the form as long as the vessel functioned. As a result, the objects often give more information about how the leather was treated than would be the case if such 'faults' were not tolerated and the object discarded. While they do not give us a complete picture of how this work was made and more particularly how it was hardened, they do give us a few clues.

Most of these objects have some degree of surface hardening, that is, the surface of the leather has been brought to shrinkage temperature. I think we can assume that this was the intended result, because it gives a hard outer shell that cannot be softened but the resulting brittleness is stabilized by the core of the hide, which usually has not been heated to shrinkage temperature. This would make a vessel that is quite rigid but relatively unbreakable, a necessary combination particularly for the larger bombards.

Waterer's discussion of these objects in Leather and the Warrior is somewhat confusing. He starts out by saying that "objects could be made to 'set' in a permanently hardened state",[9] but later contends that hardening is the result of taking tanned, undressed hide and force drying it,[10] while not taking it beyond 50 degrees C.[11] as this would make it "brittle and useless"[12]. The process he describes will not produce a permanently hardened state as 50 degrees is well below shrinkage temperature. It would produce a quite rigid vessel, but one that could be wet and reworked, one that would not be stable at the scale of the bombards when filled with liquid and not as hard as a vessel where the outer surface has been taken to shrinkage temperature. Waterer also states "even moderately hot water was unsuitable

9 Waterer, Leather and the Warrior, p.62.
10 Waterer, Leather and the Warrior, p.66 & 68.
11 This temperature is very low as shrinkage does not occur until between 70 and 80 degrees C.
12 Waterer, Leather and the Warrior, p.68

because instead of producing a highly plastic state, it causes leather to shrink and harden so rapidly that any moulding operation would be impossible."[13] This is confusing since he does not clearly define 'moderately hot' but it does suggest something less than the 75 degrees C. plus required for shrinkage to occur.

He is simply mistaken that leather taken to shrinkage temperature cannot be formed. Such forming requires a different approach, as the leather has to be kept hot and wet to remain workable. It also needs to be held in place until it is dimensionally stable, having cooled and hardened. He also contends: "but in fact no leather made before modern times could be boiled without completely ruining it"[14] (modern chrome tanned leather has a shrinkage temperature of about 120 degrees C.) and "to boil Leather is to destroy its character"[15]. In order to make sense of what happens to vegetable tanned leather when heated to or above its shrinkage temperature we need to be far more precise in our description of what constitutes "boiling leather". If you put wet leather in water at a rolling boil, particularly if it is 3mm or more, it will quickly shrink but only the surfaces will harden if it is immersed for only a short time (30 seconds or less). If the water temperature is closer to (85 to 90 degrees C.) the shrinkage temperature of the leather, the time it takes for the leather to change is extended. This makes controlling the rate of change much easier. The leather would be changed certainly but to say it is 'ruined' and its character destroyed not only indicates a very circumscribed view of what leather can do but also a lack of attention to its past uses.

Waterer's experiments on boiling are commendable; at least he attempted to sort out how leather would respond to boiling water. Unfortunately they were far too cursory to tell him much about the range of possibilities it offers[16]. He tested small pieces of leather (trunk corners), forming them before boiling them for between 5 and 20 seconds, then baked them dry. He found the results less than satisfactory, which is hardly surprising. When wet leather is heated to shrinkage temperature it will contract from about five to forty percent depending on the part of the hide used (for cowhide) and how long it is left in the boiling water. When shrunk, it takes on the characteristics of a slow moving elastic band and any shape or surface impressions will disappear. This means if Waterer's trunk corners were to maintain there original size and shape they would have to be clamped firmly in place when put in boiling water or stretched and held in place when the leather is still hot and wet.

In another experiment Waterer boiled the leather for thirty minutes. This would radically alter the material. When it is still wet and hot it would be slightly gelatinous, its fibrous quality would be completely gone and it would be very elastic. It could be stretched until it is quite thin and almost translucent but the grain would break up. If the piece were unstretched it would be extremely brittle when dry, and if stretched and formed it would shatter as it dried. Waterer has looked at just two points on a continuum of change which goes from slight surface hardening of the leather to

13 Waterer, Leather and the Warrior, p.64
14 Waterer, Leather and the Warrior, p. 64.
15 Waterer, Leather and the Warrior, p. 62.

16 See Rex Lingwood "Leather and Heat", The Designer Leatherworker, Vol. 1, #2, 1990,

the point it completely dissolves in the water. This latter stage is in fact how ‘animal glue’ is made.

Figure 9. Bottle, 6’“ long, 17th century, Museum of Leathercraft

The shapes he uses in these experiments have no relation to the work he is investigating. He seems to have assumed that what worked prior to ‘boiling’ would work in much the same way after. When he found that this was not the case he concluded that ‘boiling’ was not a viable process. The simple fact was he did not have enough evidence to draw any reliable conclusions. ‘Boiling’ is, in fact, a quite viable process for hardening leather if it is taken to mean the leather has in whole or in part been raised to shrinkage temperature.

The real question about the vessels is not ‘if’ the work was taken to shrinkage temperature but rather the means used to do so? If ‘boiling’ is taken to mean immersing the leather in very hot or boiling water was this process used in any of the work that survives? The answer is very likely a resounding maybe.

It is clear that these vessels have been hardened and this most often is surface hardening. Boiling (by which I mean immersing in water above shrinkage temperature) will produce this result and some indicators point to it. There is often cracking in the grain around the top and spouts of the bombards and blackjacks or the ends of bottles *(figure 9)*. The finish (japanning) often fills them slightly indicating that they were the result of the shaping or adjusting the shape prior to applying the finish. If for example these works were hardened by dipping them in boiling water after they were fully constructed it is probable that the shape of the spout and rim would be distorted when shrinkage occurred and this part of the form would have to be adjusted to correct the shape of the work. If the surface had begun to cool before this was done it would crack when the leather was stretched to reshape it. Such a procedure could also explain the slight distortions in the symmetry of some of this work as well as a lack of tautness in the forms. However, boiling is not the only possibility and the distortion and lack of tautness could as easily be the result of baking the work. There are also other indicators that point to baking. A blackjack in the Museum of Leathercraft (# E46,

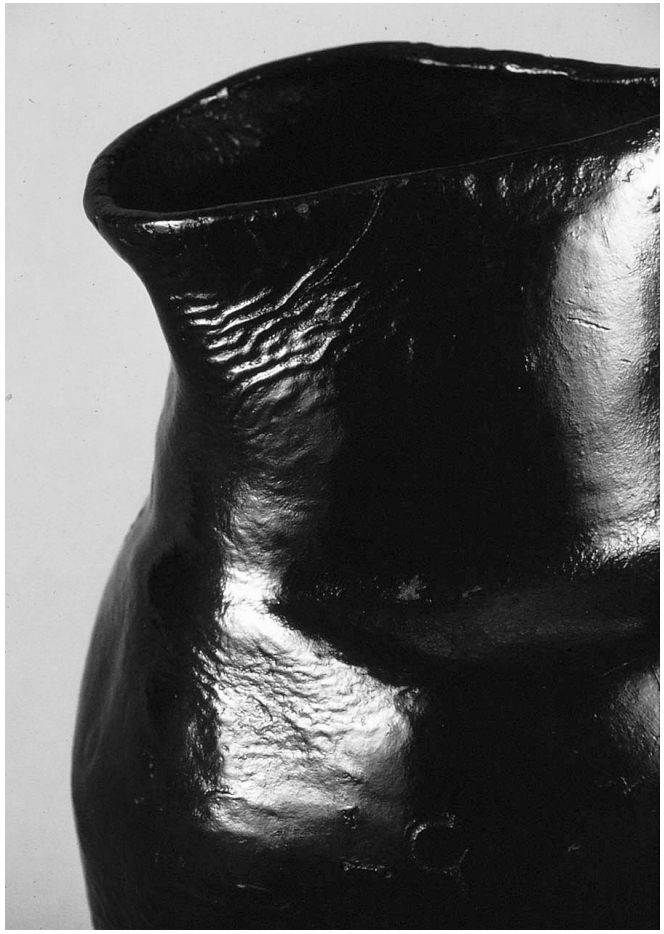

Figure 10. Blackjack, detail, Museum of Leathercraft, Edmondson Collection

Edmondson Collection) has a small area on the body of the work where the leather wrinkles quite dramatically *(figure 10).* Also the form of the jack in this area is distorted, the rounded shape has shrunk and the area has flattened out. This is an unusual occurrence, which I have been able to reproduce only under quite specific conditions. It tells us the following things: the jack was being baked (or stoved to use Waterer's description). The work was almost certainly fully formed and constructed. If interior forms were used they would not be tight to the side of the leather but may have anticipated the leather shrinking around them. If sand was used it is possible that it might be only partially filled and probably not tightly packed. The leather was damp. The work was placed in an oven where the temperature was already higher than the leather's shrinkage temperature or the temperature was raised during baking to more than shrinkage temperature` (in fact a temperature as high as 150 degrees C. would not be improbable). The area of the leather that wrinkled had a loose fibre structure, probably from the belly, neck or leg or close to those areas. This loose fibre structure holds more water because of its low fibre density. As the work was heated water would tend to evaporate from the surface (and the surrounding area) but the interior in this pocket would still be damp when shrinkage temperature was reached and, as a consequence, it would shrink quite dramatically. However the moisture would have evaporated from the surface so it would not shrink, but wrinkle as the interior shrank. (Shrinkage only occurs if sufficient moisture is present.)

Unlike the highly decorated Italian work, the English vessels do not usually have surface decoration. This would be expected as taking the leather to shrinkage temperature would remove any stamped or tooled decoration and distort decoration that has been incised. This does not make decoration surface decoration impossible but it does make it more difficult which may explain why it is often absent or minimal. When it is not absent one of the more interesting

characteristics of this decoration (usually found on the bottles) is its relative faintness, which is very unlike the deep and very precisely defined characteristics of leather that has not been taken to shrinkage temperature *(figure 11).* Such decoration would need to be done after the leather has been taken to shrinkage temperature while the leather is still hot and wet making an impression possible. But the tool making the impression would have to be held in place until the leather has set or the impression would not stay in place when the leather was in this elastic state. The relative faintness of the impressions has two possible explanations: the leather may have hardened slightly before the decoration was applied or the there was a loss of

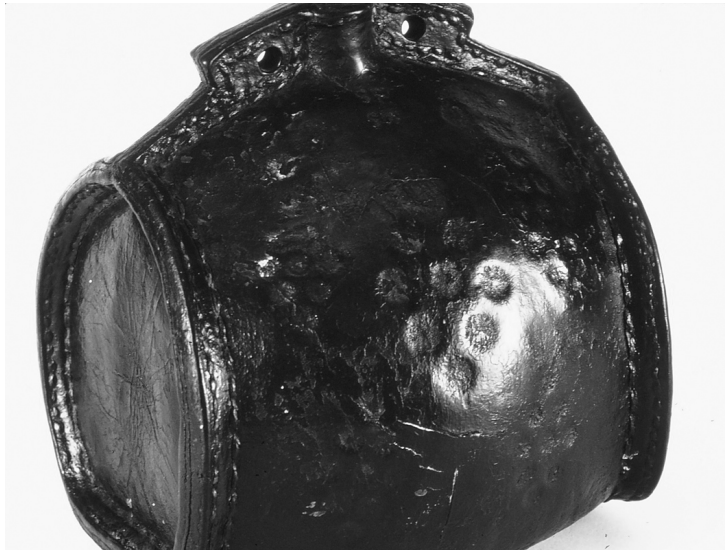

Figure 11. Bottle, detail, 7" long, probably 17th century, Museum of Leathercraft

definition after the impression was made either due to residual elasticity or further contracting of the leather as it fully dried.

Not all objects that appear to be 'cuir bouilli' of this type are as easily explained. For example, the dag pistol bottle *(Figure 12)* in the Museum of Leathercraft (Edmondson Collection E45) has both repousse and tooled decoration and it does not appear to be stuffed leather. It has not been hardened as much as most of the keg type bottles, the blackjacks or the bombards and is a more finely wrought work; it looks very much like cuir bouilli. However the form in this work would not require as much hardening to maintain its stability. In fact the forced drying Waterer describes might be quite sufficient to insure stability if its intention was more decorative than functional. The similarity to the bottles, black jacks and bombards may be limited to the fact that it is formed and finished by japanning. On the other hand, we may have a more sophisticated maker, perhaps capable of producing a more difficult and dramatic form (a two part mould?). When there are differences in objects it is likely that there are differences in the making process. Consequently, when we group objects it is important to pay as much attention to the differences as to the similarities.

The evidence suggests Waterer was right that baking was the preferred method of setting these vessels. It is possible that boiling may date from an earlier period and that baking simply superseded it because it offered more control, and increased production[17], or that boiling was used for some

[17] Though baking would take longer, many more objects could be done at one time and the objects would not require constant attention so other operations could be carried out simultaneously.

Figure 12. Dag Pistol Bottle, 1708, Museum of Leathercraft, Edmondson Collectio

objects and not for others. It is likely that there were quite deliberate variations in the hardness due to the requirements of different types of vessels as well as accidental variations due to material, the varied skill or inattention of makers. However there is little question that the temperature employed and the degree of hardening sought was much greater than Waterer was willing to entertain. He examined a great many of these objects, and he can say their " only weakness [is], at times brittleness"[18]. Brittleness is one of the principal results of heating leather to shrinkage temperature and holding it there. His reluctance to accept what he was seeing was largely intentional seems anomalous.

My discussion so far has not touched on leather armour. The problem is little survives. Waterer only allows the

[18] Waterer papers, perhaps a draft of the chapter on 'cuir bouilli' for Leather and the Warrior.

existence of one piece of leather armour in England, the horse crupper from the time of Henry VIII in the Tower of London. He mentions the piece in the British Museum identified by A.B.V. Norman (then keeper at the Wallace Collection) as an arm protector, but does not comment on it in Leather and the Warrior. However in a letter to Norman he suggests that it may have been parade armour[19]. This is an interesting distinction as the crupper could just as easily be parade armour (in fact it most probably was). What the horse crupper is not, however, is 'cuir bouilli' as Waterer claims[20]. The leather is backed with gesso and canvas and this is what makes it hard. Along edges and in areas where the backing has broken away the leather is quite flexible, indicating that there has been no hardening at all. It was painted black in the nineteenth century[21], but its original colours were white and red, and the back is a creamy yellow. This would indicate buff leather not vegetable tanned which would tend to support Waterer's contention that canvas backed buff was sometimes used to make the cuirie or cuirass[22]. This misidentification of this work as 'cuir bouilli' does not necessarily mean that water and heat hardening processes are less tenable as a means for making armour. However, they may have been used in an earlier time period or in different circumstances.

The work done by John Coles, attempting to reproduce a Bronze Age shield, demonstrates that heavy leather with a boiling water hardened outer surface provides very effective protection[23]. Waterer is rather disingenuous in his discussion of Coles' work. He ignores Coles method of making the shield, forming it over the block then slow drying it at a temperature between 10-15 degrees C., then experimenting with hardening it using a number of different methods. Waterer also ignores his conclusion that hardening in boiling water produced the most satisfactory result and substituted his preferred process, "[drying] in a warm place until rigid", and attributed it to Coles.

Both 'cuir bouilli' methods could have been used to make armour. Hardening using water and heat is, if the Bronze Age shield is in fact hardened this way, very old indeed. Stuffing with high melting point fats such as stearic acid dates back to at least the Romans and it is likely that the use of pine pitch is much older. It is of course possible to test whether these processes can be used to make armour that protects the wearer in the way Coles tested his Iron Age shield. However in the absence of more material or written evidence it will remain very difficult to judge which processes were used or if all were used either simultaneously or at different historical periods. Knowing what will work cannot tell us what was done or when. There must be material evidence to establish what was actually made and this is largely absent for leather armour.

The earliest examples of leather drinking vessels date back to about the 13th or 14th century and the highly decorated

19 Waterer papers, letter to A.S.V. Norman, probably October or November 1975.
20 Waterer, Leather and the Warrior, p.73 & 74.
21 K.N. Watt, Keeper of Armour, Tower of London, Conversation with the author,1988.
22 Waterer, Leather and the Warrior, p.71.
23 John M. Coles, Illustrated London News, Archaeology By Experiment: "Bronze Age "Shields Made At Cambridge Which establish That Leather Was for Use, Bronze For Ritual And Show, March 2, 1963, p.299 - 301.

scroll cases, missal cases, powder flasks etc. that remain only date back to approximately the 12th century with most being much more recent. These objects probably represent the end of a history that goes back much further. Waterer was inclined to think that the process for forming leather (and for making 'cuir bouilli') "had been used without break 'from time immemorial' until the present day and there [was] no reason to suppose there was any significant change in this or any other process connected to the making of leather goods"[24]. If this were true the answers to the questions surrounding 'cuir bouilli' would surely be obvious. They are not, and Waterer's proffered process leaves significant characteristics of most of this work unexplained. Objects and processes evolve over time, they are adapted as needs and fashions change, people tinker with things, develop new ways of doing things and then lose track of old methods when they have been superseded. We only have to look at the history of the stuffed leather objects from about the 12th century until the early 17th when they pretty much disappear, to see what can happen to even a highly evolved body of work.

In Waterer's lifetime leather's position in our culture shifted dramatically. It was widely used in a great variety ways from engine seals and industrial belting to the finest handbags, from every day products to luxury items. By the end of his life, leather was used almost exclusively as a material for luxury goods. The range of characteristics and uses we now exploit is greatly diminished. The kind of hardness found in the leather drinking vessels is now absent from contemporary perception of the material.

24 Waterer Leather and the Warrior, p.67

The knowledge of the methods of hardening leather as practiced in the past (pre 1825 approx.) is now almost completely a matter of conjecture. While it is possible to at least partially read these often diverse objects, a complete picture of how they were made is probably irrecoverable, although our best guesses can be far better than they have been to date. However, this would require that they receive far more examination than they have. Perhaps the fact that the use of leather is now largely a luxury item, and vegetable tanned leather, the type of leather that was hardened, is fast becoming an exotic side bar in the material's current production and use, will make looking at these quite fascinating historical objects a more interesting area of enquiry.

I hope the great differences between the two categories of objects commonly designated as 'cuir bouilli' is clearer. I also hope there is a better understanding of the English vessels. While they appear to be simple and crude it is clear that the processes used to make them are multistaged and complex. The use and the users meant that the precision and sophistication of their final form was not always a major consideration so considerable latitude in the skill and precision of execution was considered acceptable at least some of the time.

The Italian scroll cases powder flasks etc. are also very complex; however, the complexity here is matched if not exceeded by the skill levels required for their execution. These are objects intended for a very different clientele. For objects of this quality, rendered in metal, we have a more complete idea of the technical procedures required to realize them. For the leather objects crucial elements are

missing including how and with what the leather was stuffed, as well as the stage in production the decoration was done and much else. If as I suspect the decoration was done after stuffing, how was it done? This would require specialized heating equipment of a quite sophisticated order. We usually expect to know more about luxury goods yet these works are very much a mystery.

Both these classes of objects quite suddenly cease being produced. For the blackjacks, bombards and bottles this happens about the end of the first quarter of the 19th century. Why did they persist in England in the first place? What caused their demise at that time? Both questions seem to me to make them cultural markers worth looking at. The largely Italian work reaches the apex of sophistication and then is gone by the middle of the 16th century. Other art and craft practice similar in style continued. Why?

Postscript: In earlier versions of this paper some of my colleagues felt that I was too hard on John Waterer. I hope that this version makes it clear what an immense debt we owe to his work on the history of leather craft. I know from my conversations with his daughter who finished the manuscript for Leather and the Warrior that while he argued his positions forcefully he did not consider his work to be the final word on the subject and in many cases thought it preliminary and looked forward to seeing his writing simulate further research. Because Waterer made such an immense contribution to the history of leatherwork there has been a tendency to take his work as definitive without sufficient examination of what he said. This I believe does a disservice to the field and to Waterer himself.

I would like to thank the Canada Council for funding the research for this project and The Liguria Study Center of the Bogliasco Foundation where much of the final version of this paper was written. I would like to thank the Museum of Leathercraft in Northampton, England, the Wallace Collection in London, England, the Tower of London and the Deutsches Ledermuseum in Offenbach, Germany, who allowed me access to their collections and the curators, keepers and restorers who assisted me and shared their expertise, as well as Neil MacGregor, a most accomplished leatherworker and for many years a director of the Museum of Leathercraft, whose expertise in and enthusiasm for the history of leather craft was a great help to me. I would like to particularly thank the Museum of Leathercraft and the Deutsches Ledermuseum for allowing me to photograph and reproduce works from their collections.

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