TIMBUKTU RARE MANUSCRIPTS PROJECT: PROMOTING AFRICAN PARTNERSHIPS IN THE PRESERVATION OF AFRICA'S HERITAGE

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Abstract

This article describes the Timbuktu Rare Manuscripts Project. The project is concerned with providing assistance to Mali in the conservation and preservation of the rich trove of manuscripts to be found in and around the immediate environs of Timbuktu. The project is a result of a bilateral agreement concluded between the governments of Mali and South Africa, following a visit by President Thabo Mbeki to Mali in 2001. The article begins by briefly examining the history of Timbuktu and how it became a highly regarded centre for Islamic scholarship, by way of contextualizing the presence of manuscripts in Timbuktu. As a centre for scholarship, Timbuktu saw the founding of many libraries around individual scholar's schools and mosque's libraries. It is the remains of these libraries which now present a challenge to preserve. The article then looks at the challenges of preserving manuscripts in a very harsh environment where temperatures can reach the upper-50s in summer; where dust and insects are an ever-present reality and threat to the manuscript heritage of Timbuktu. While the article focuses on the Timbuktu Rare Manuscripts Project, it links conservation to the African context by describing the basic conservation orientated institutional practises which can be implemented by institutions of any size faced with the preservation of their paper-based documentary patrimony.

Keywords: Conservation, Paper, Preservation, Timbuktu Rare Manuscripts, Watermarks.

Introduction

My presentation concerning the *Timbuktu Rare Manuscripts Project* will form something of a report about what the SA Conservation Team has learned about the manuscripts they have encountered in Timbuktu. This report will not only concern itself with the areas closely related to conservation: material composition, types of damage, extent of damage, etcetera; but will also describe what the SA Conservation Team has learned through the ongoing research regarding Islamic manuscript production, knowledge transmission, the role of paper, watermarks and the presence of European-manufactured paper in Timbuktu. The latter is an important element of the SA Conservation Team's efforts to better understand the context of the Islamic book culture in Africa in which the Timbuktu manuscripts originated and were utilised.

As conservators, we feel that it is important to gain an understanding of the context in which book or manuscript artefacts arise, are used, archived or discarded. As conservators we strive for the most complete understanding possible of any given item's history and circumstances in order to make treatment decisions that are as informed as possible. In this part of Africa we are probably more familiar with the records of our mutual colonial and post-colonial histories - compared to West and North Africa with its long Islamic history which is reflected in the composition of its recorded history. The research of pan-Islamic book culture and specifically that found in Africa will fulfil another of the Timbuktu Rare Manuscripts Project's expected outcomes, that of capacity building. It is expected that the Project will benefit both Mali and South Africa. The SA Conservation Team has already learned much about traditional leather working techniques from our Malian colleagues; and through our research we will build a storehouse of knowledge and expertise about pan-Islamic and African-Islamic book culture while communicating our conservation knowledge to our Malian colleagues.

The place of Timbuktu [1]

To begin, I would like to set the context for this paper: that is the place of Timbuktu. Timbuktu is located in the modern-day North African country of Mali close to the river Niger [2] at its northern-most

bend, on the fringes of the Sahara desert. The city of Timbuktu is the stuff of legend and myth, as much as it is of actual history. Timbuktu is thought to have been founded some time around 1100 CE (Hunwick 2003:1;Saad 1983:4); its reputation and importance is sometimes described as an accident of serendipitous geographical positioning (Bovill 1958:88). The placement of Timbuktu is at the crossing of the Niger River and a major caravan route that continues to Marrakech (Morocco) in the north and swings towards the Sudan across the Sahara desert as well as one of the major routes for pilgrimage to Mecca. The chief impetus of Timbuktu's establishment was probably as a convenient and increasingly permanent centre of trade and commerce (Bovill 1958:105; Saad 1983:6). The town was first a camel market, evolving into a more general market which expanded to create a settlement of many thousands of prosperous inhabitants (De Villiers & Hirtle 2003:212). The commercial prosperity Timbuktu enjoyed brought with it both wealth and culture. [3]

By the mid-15th century Timbuktu enjoyed wide renown as a major centre of Islamic learning (Hunwick 2003:2). However, Timbuktu as a centre of learning was not unique to West Africa, and needs to be viewed in the context of a fully fledged tradition of Islamic learning throughout the whole of the West African and Sudanic region; [4] and of pan-Islamia in general, with whom Timbuktu maintained strong trading and intellectual ties (Saad 1983:4, 17). Despite the reputation Timbuktu enjoys today, it was not the sole city of scholars in the region; rather it shared its social traditions of learning with other cities and mercantile communities in the region (Saad 1983:18). Timbuktu was and is an Islamic city firmly rooted in Africa.

Timbuktu's manuscripts and libraries

Timbuktu's most celebrated scholar, Ahmed Baba (1564-1627 CE) claimed that his personal library contained some 1 600 volumes (Hunwick 2003:3), and that his was the smallest library of any of his family. His family, the Aqit, were the leading scholarly family during the 16th century in Timbuktu. The traveller Leo Africanus, who visited Timbuktu in the early part of the 16th century, noted that books were the most valued among the various articles of trade during 16th century Timbuktu and wrote that: "... hither are brought divers manuscripts or written books out of Barbary, which are sold for more money than any other merchandise." (De Villiers & Hirtle 2003:212;

Saad 1983:88). Timbuktu's extant manuscript collections were augmented over the centuries by scholars returning from pilgrimage and study in other centres of Islamic learning, often copied by their own hands. Within Timbuktu there existed an active copying and scribal industry (Hunwick 2003:3) which ensured a continual production of manuscripts for the consumption of scholars, students and literate citizens.

The easy availability of manuscripts was an important factor in the integration of Timbuktu into the wider context of pan-Islamic scholarship (Saad 1983:79) – and this remains the case even now as scholars from far travel to Timbuktu to study the manuscript collections there. Extensive private libraries are known to have existed from an early date in Timbuktu; and that these libraries were open to consultation and borrowing by interested scholars. Scholars of Islamic culture have noted the fact that extensive private and public collections have been a feature since the earliest days of Islam throughout Islamic lands, a situation which contrasts starkly with the dire picture that contemporaneous Europe presented. Currently there are some twenty private manuscript libraries in Timbuktu and approximately one hundred other libraries in the immediate environs of Timbuktu (Hunwick 2003:4).

Scholarship as a social tradition in Timbuktu [5]
Islam views teaching as both an obligation and an honour. Throughout the pan-Islamic world ambitious men were able to acquire status and build a career as teacher, scholar, courtier or jurist after undergoing extensive learning apprenticeships in the Islamic sciences. Saad (1983) in his study of the social history of Timbuktu as a scholarly centre has described Timbuktu as a city defined by a tradition where status and influence could most readily be derived through the acquisition of Islamic learning (Saad 1983:22) – and a factor which impacted very strongly on the city of Timbuktu's social stratification (Saad 1983:4) and sense of identity. [6] The activity of teaching and scholarship seems to have formed as a sort of social adhesive serving to cement ties between families (Saad 1983:70). Ties forged through the student/teacher relationship also appear to have resulted in added ties through matrimony and facilitated joint ventures in commerce. The apprenticeship of a prospective scholar of Islam has parallels to that of an apprentice craftsman. That is, that a

general understanding seems to have existed between the two parties that in exchange for the knowledge imparted, a student would amongst other things, assist his master in whatever may have been his source of income. Many students assisting their teacher in his business undertaking, Saad (1983:70) makes particular mention of the many tailor shops in Timbuktu as venues for this employment of Timbuktu's many students.

Islamic manuscript tradition: the materials of transmission and social context of knowledge transmission

Any given book or manuscript is always more than just the textual information that it holds. To conservators, scholars of book historiography, librarians and archivists (amongst others) the book is a living historical entity, capable of revealing much more information than just that contained in the text and/or illustrations.

The study of "the book" as a socio-historical entity is a complex study of many interrelated factors (Atiyeh 1995:xiii). Studies of book historiography of necessity embrace: the origins, production (that is, materials, formats, script, typography, and illustration), content, use and role of books in culture, educated and society in general. Our present understanding of the ancient world (as well as of relatively more recent times) tends to be overwhelmingly dependant on texts (Bowman and Woolf 1994:1); and that our use of these texts (be they literary or documentary in nature) depends on the assumptions which we make about how they were originally produced, read and understood.

Islamic knowledge transmission as a context of Islamic manuscript tradition

Before examining the manuscripts of Timbuktu in more detail, I would just like to briefly look at the context in which Islamic manuscripts were made and utilized. "Seek knowledge, even as far away as China" is a famous injunction attributed to the Prophet Muhammad. This injunction reflects a principle generally held in the Islamic world: that the pursuit of knowledge *('ilm*), and specifically religious knowledge, is a worthy activity to be encouraged (Berkey 1992:3). Islam's high estimation of the value of knowledge translated into broad-based social and cultural support for education and study. All Muslims are

encouraged to acquire at least a functional familiarity with the revealed Koran and the traditions (*hadith)* that embody the sayings, commands and stories handed down from the Prophet Muhammad and his companions that form the basis of Islam as a religion and as an all-embracing way of life (Berkey 1992:4) [7].

When I first became involved in the Mali Rare Manuscripts Project, I more-or-less assumed the primacy of the written manuscript in Islamic learning culture. After all, I was being asked to assist in the preservation of an immense manuscript heritage. The books I had up until then read on Islamic culture and learning conveying the picture of a society that was highly literate culture orientated around text of a manuscript. [8]

The research I have engaged in for the Project has created a more complex picture of a society in which writing was viewed with a certain wariness (Robinson 2003:172), and especially so when it came to the writing of religious texts. However, for the most part Islam is probably unique in valuing both orality and writing in the transmission of knowledge (Cook 1997:437, 489; Berkey 1992:21, 43). The equal importance of orality in knowledge transmission is a factor which shaped the nature of Islamic learning culture and had enormous social consequences. [9] This factor which has a certain resonance for us in this part of Africa, where orality and literacy have traditionally each been consigned to polarised sides of a debate about Africa's intellectual heritage and future.

This is not to say that manuscripts and written texts did not play an important role in Islamic education; as the immense numbers of surviving manuscripts surely do attest to (Berkey 1992:24); the fact is that manuscripts had a significant presence in pan-Islamic intellectual and cultural life. The regard for manuscripts was such that the scholar and educator Ibn Jamaa found it necessary to remonstrate with students who used their books as pillows, as fans, or to squash bedbugs with; Ibn Jamaa went on to write elsewhere that a person who did not keep a book "in his sleeve" could have little wisdom in his heart (Berkey 1992:24).

The materials and objects of knowledge transmission: paper and manuscripts

Paper: its history and impact on Islamic culture – and a legacy of Islamic culture

The histories of paper and of Islam are closely intertwined. Paper served as a medium of cultural, religious and scholarly transmission of Islamic culture; while Islamic culture, trade and military victories resulted in the spreading of paper from its Chinese origins – across the Asian continent, Near East, North Africa and finally to Europe (via the Iberian Peninsula). [10] A vestige of the pivotal role played by Islamic civilization in the spread of paper making is preserved in how paper is still counted today in bulk quantities called reams (Bloom 2001:9). [11] The unification of Western Asia under Islam in the 8th century meant that the Islamic encounter with paper in Central Asia resulted in its rapid spread from Samarqand to Iran, Iraq, Syria and North Africa to Spain within a mere two centuries; compared to the approximately five centuries it had taken to spread from China to Samarqand (al-Hassan & Hill 1992:191; Bloom 2001:47; Hrbek 1988:5).

The introduction of paper and papermaking across the Islamic lands in the 9th and 10th centuries is generally acknowledged by scholars to have been a remarkable historical and technological achievement that transformed society in its wake (Atiyeh 1995:xiv; al-Hassan & Hill 1992:190; Bloom 2001:47). [12] Documents, books and other forms of graphic notation (all of which represented distinctly new ways of thinking) spread through Islamic society the increased availability of paper encouraged the transition in medieval Islamic times from a memory-based to a text-based culture.

Paper was considered a superior product: its strength, pliability and relative plentifulness quickly gave paper the upper hand over the increasingly scarce papyrus. The first paper mill in Islamic lands was established in Baghdad in 794-95 CE (al-Hassan & Hill 1992:191; Bloom 2001:86). Islamic paper is traditionally composed of linen and hemp fibres (and sometimes a mix of the two). The raw materials for paper production mostly came from the recycling of old cloth rags and discarded rope/cordage; though there is evidence that virgin flax

fibres (that is, linen) were also used for paper production (Bosch 1981:28).

The social impact of paper

It is during the early Abbasid period (750 – 1258) which is often referred to as the "golden age" of Islam that saw an increase in the publication and transcription of manuscripts, as well as in bookbinding and book selling as part of a wider cultural and intellectual efflorescence (Atieyh 1995:xiv; Robinson 2001:27). This increase in the circulation of manuscripts was undoubtedly greatly assisted by the introduction of paper in the 8th century CE paper arrived amidst a cultural explosion which allowed paper production to take root and flourish.

The example of the *warraq* is frequently cited as a product of the impact of paper on Islamic society. The profession of the bookseller/ copyist (*warraq)* flourished to the extent that the *warraqunn* became a major presence in Islamic cultural life (Atiyeh 1995:xiv; Bloom 2001:90). [13] They were not only stationers and/or copyists, but also booksellers, and in many cases were men of letters themselves. [14] Paper was used extensively throughout pan-Islamia for all sorts of documents, correspondence, books and as well as for wrapping and packaging. In Baghdad alone there were more than 100 premises at which books were made and sold during the 9th century CE. Private libraries abounded and public libraries were established everywhere and Baghdad contained no less than 36 in 1258 CE (al-Hassan & Hill 1992:191).

The wider economic importance of paper as a traded commodity is further demonstrated by the existence of a "paper market" in Baghdad circa 830 – 32 CE (Bosch 1981:26), selling not only paper but books and scribal services as well. Paper was also an important export commodity for the economies of Islamic centres. Europe first came to know paper as an imported commodity from Islamic lands.

According to historical accounts, the Islamic papermaking industry was extensive and vibrant. Documents record that by the end of the 12th century the city of Fez alone had some 472 paper mills (Bloom 2001:86); as late as the 14th century Fez exported fine paper to Majorca (in modern-day Spain) and Aragon.

Muslim papermakers were the first to make paper in different grades, colours [15] and standardised sizes [16], for example, there was the so-called "Bird's Paper", so named for its lightweight qualities which made it ideal for use in sending messages by carrier pigeons (al-Hassan & Hill 1992:191). However, paper size standardization was not a universal phenomenon throughout pan-Islamia; scholars note that in Spain only "anarchy reigned" with regard to any concern for paper size standardization (Bosch 1981:31).

The decline of the Islamic papermaking industry

Scholars generally ascribe the reason for the widespread adoption of paper throughout Islamic lands to the bureaucratic necessity of documenting state functions (Bloom 2001:89,91; Robinson 2003:20), for example, the levying and administration of taxes, paying of the army, building of public works, and the like. This aspect of Islamic society grew in size and complexity during the 7th and 8th centuries (Robinson 2003:20). None of this was unique to Islamic societies - what was striking about the early Islamic case was how quickly paper usage caught on (Robinson 2003:27). Paper monopolised the market from the 9th and 10th centuries, proving not only to be more plentiful, but also proving to be a cheaper medium than either papyrus or vellum to produce (Robinson 2003:27). This voracious appetite for paper may also have served to ultimately undermine the Islamic paper making industry. By the mid-14th century Maghribi and Egyptian chancelleries had begun to use European papers; Islamic lands eventually becoming net importers of the European-manufactured product (Bosch 1981:32). Italian paper makers had begun manufacturing paper from the 13th century CE and were soon exporting it to North Africa and Western Asia. [17] By the 16th century paper manufacturing had largely disappeared from Islamic lands, with the exception of Turkey, Iran and India. The eclipse of the Islamic papermaking industry has been so thorough that any memory of it has also been eclipsed, it is only in more recent times that scholarship has been able to recover the Islamic contribution to the history and spread of paper (Bloom 2001:9).

This is not to say that this change was either smooth or uncontested. Muslims were troubled about using paper manufactured by non-Muslims. Some papers even bore images (in the form of watermarks)

that some Muslims found objectionable (Bloom 2001:86). [18] European paper manufacturers, with an eye to satisfying their clientele, began to incorporate symbols with significance to Muslims as watermarks (Bosch 1981:32), for example, the so-called "three crescents paper" made in Venice. This class of watermarks became increasingly common in papers of the 17th and 18th centuries. There is no evidence to suggest that figurative or epigraphical watermarks were used in traditional Islamic papermaking. The lack of watermarks in Islamic manufactured paper is generally ascribed to the technical differences in the papermaking process, particularly the greater flexibility of the Islamic papermaking screen (Bosch 1981:30).

Paper in the Maghrib [19]
Paper as a manufactured and traded commodity had a significant presence in the Maghrib; it was traded along the known trade routes along with other European trade goods (Bovill 1958:243-4). [20] Though it would appear that compared to other Islamic regions, parchment appears to have been supplanted by paper at a much later date; parchment use in the Maghrib was still in common usage until well into the 14th and even 15th centuries. [21] It is somewhat ironic then that the sole surviving account of medieval Arab paper-making available to scholars is that from an 11th century North African account (Bloom 2001:85; Bosch 1981:31). [22] It was also from the Maghribi region that technology of paper manufacturing spread to continental Europe via the Iberian Peninsula in the 10th century. Though it is probable that Europe was acquainted with paper as a traded commodity from far earlier than this date (Bloom 2001:87); by the 11th century paper mills were being established throughout the Iberian Peninsula. [23]

The significance of the presence of western manufactured paper in Timbuktu for the Project: and watermarks as sources of bibliographic information
During our December 2003 visit the Mali Rare Manuscripts Project's Technical Team of conservators noticed that one of the manuscripts that we were examining for possible preservation treatment was made of European-manufactured paper. The European origins of this paper could be determined due to the presence of the distinctive

"laid" and "chain" lines we saw in the paper. These lines are impressions in a sheet of paper, formed by the mould traditionally used to make handmade paper. Intrigued, we decided to see if we could find watermarks in the paper, and to our excitement we could see letters and an indistinct design/symbol. On our return visit in 2004 we examined two manuscripts with the intention of carefully documenting the watermarks in order to be able to research the watermarks we found on our return from Timbuktu.

Our initial excitement in discovering the presence of European-manufactured paper (and the watermarks) was due to the understanding that much research had been done with regard to European manufactured watermarks. Bibliographers have also done much to trace the place of origin of the watermark (and thus of the paper itself) and in some cases to very narrowly identify the person or generation responsible for making the paper. This knowledge could tell us so much more about how the manuscript or paper arrived in Timbuktu, where the manuscript may have originated and something about the economic of manuscript production in Timbuktu and further abroad, as well as something about the extensive trade in paper between lands surrounding the Mediterranean Sea and further a field.

Despite the fact that we had encountered this European-manufactured paper in Timbuktu, in other respects it reflected the preferred aesthetic of Islamic paper with its highly burnished surface. It was customary for Islamic writing papers to be given a highly burnished surface (Bosch 1981:35) in addition to the sizing of starch (Islamic) or gelatine (European) papers to make a surface suitable for writing. The burnishing on some of the papers I have encountered has in some cases so flattened out the texture of the paper that one cannot see the slightly corrugated effect of the chain lines as is usually the case.

What are watermarks?

Before continuing, I would just like to briefly define what watermarks are. Watermarks are generally defined as a distinguishing letter, design, or symbol incorporated into a paper during the manufacturing process, these marks are most easily viewed as a translucent impression in the paper when held up to a light source. [24] The earliest watermarks appear in European-manufactured paper from

the 13th century. [25] In addition to the watermark, a countermark may appear on the same sheet of paper on the opposite half of the sheet to the watermark itself. The countermark is a generally smaller or subsidiary mark; in most cases the countermark appears to be the initials or name of the papermaker, countermarks began to appear in paper during the 17th century.

For the purposes of analysis and study, watermarks have been divided into four loose categories:

- The very earliest watermarks: generally consisting of simple crosses, circles and knots, triangles and three-hill symbols, etc.
- Human beings and the works of "man": ranging from body parts such as feet, heads and hands; tools such as scythes, swords, hammers, shears, etc. (Hunter 1930:300).
- The "natural" world: consisting of symbols of flowers, fruit, grains, trees, etc (Hunter 1930:309).
- Animals, including wild, domesticated and legendary animals: such as snakes, fish, turtles, crabs, scorpions, horses, dogs, lions, etc (Hunter 1930:311).

Theories abound as to why watermarks originated and how their incorporation into a sheet of paper became an established practise. There are the obvious explanations which ascribe the origins of watermarks as a trade or manufacturer's mark (which also acted as a from of guarantee of manufactured quality); other explanations explain watermarks as being indications of quality, weight and size of a sheet of paper; as identifying marks/guides for illiterate craftsmen/ traders; there are also more esoteric claims that certain religious groups of craftsmen (usually described as heretical or unorthodox) who embedded their symbol(s) in paper as a covert form of communication.

Researching the watermarks found in manuscripts at Timbuktu

The first thing I encountered when I began to more thoroughly try to research watermarks and their usefulness to us in locating place and date of manufacture of the paper we encountered in Timbuktu, was to have some of my romantic optimisms that I described above regarding the usefulness of the watermarks blown straight out of the water.

Bibliographers and paper historians uniformly state that watermarks (sadly) seem to have little value in determining the dates of paper -

and consequently books, manuscripts and prints; or in determining the geographic location of the paper's manufacture (Hunter 1930: 294). This is due to a variety of reasons: [26] some of the reasons are fairly straight forward, for example, a mould with a papermaker's symbol/name may have been sold on following his death or dissolution of the mill. Other explanations are of a more sinister nature, for example, the replication of watermarks from a highly regarded mill or region of manufacture in order to command a better price. I am somewhat amused that the only watermark from a manuscript in Timbuktu that I have thus far found a "match" for in a catalogue of watermarks - is one that is listed as a watermark by a Dutch papermaker made in imitation of a French paper maker, at a time when the Dutch papermaking industry was undergoing a period of decline (Churchill 1965:28, 91, CDXXXII). The literature on watermarks I have thus far encountered conveys the sense that while there is considerable uncertainty regarding watermark identification; watermark evidence alone can provide clues rather than precise facts. [27]

Despite all these caveats concerning the usefulness of watermarks to bibliographic research, literature on the subject of watermarks states that the continued research on watermarks has much to offer, and that they continue to devote much space in their books on the topic of watermarks. The sense of things is that it is a field that has much scope for further study, partly due to the challenges presented by the physical nature and quirks of the watermarks and paper.

An unexpected use for watermarks

The SA Conservation Team found that the watermarks we encountered in manuscripts in Timbuktu to be of an unexpected use. We found in some of the manuscripts that the watermarks would run across the (possible) spine fold of a manuscript's folios at right angles to the edge of the individual leaves. We found that in the manuscripts we examined that the watermark image runs at right angles to the (presumed) spine fold on the right hand of the manuscript.

In our initial investigation of the manuscripts in Timbuktu we encountered only piles of single sheets enclosed in leather wrappers that served as the manuscript's cover. There was no real evidence of any sewing (in the form of sewing holes, or thread remnants) or

attachment of the text block to the cover. This manuscript format or structure would have required the folding of pages into uniform sized sections in order to affect the sewing of a text block that could then be attached to the wrapper cover by means of interior leather joints. We were beginning to come to the conclusion that for the most part the manuscripts in Timbuktu consisted only of single sheets – though they may not originally have started out in that particular format. It is evident that the manuscript's covers that we have examined have in many cases undergone extensive patching and repair. Many covers may even be replacements of the original wrapper, however, this will be difficult to establish conclusively for obvious reasons.

While leafing though the manuscripts we began to notice that we could in effect, "match up" watermark images that ran across to separate pages. By taking a notation of the entire manuscripts' watermarks and matching the two halves of the image up, we could tentatively conclude that at one time the manuscript consisted of folded groups of pages (quires). Our hypothesis was confirmed when we encountered one to two of the last remaining folios deep within the manuscript's text block as we worked through it. Due to the fact that the paper's edges had not been trimmed, we will also be able to tentatively reconstruct the original paper size as well.

The question of whether a manuscript consisted of folded quires or single sheets may appear to be a nit-picky type of conundrum so enjoyed by members of my profession. But it has a very real impact on the decisions taken with regard to the treatment and repair of any given item under a conservator's care. The conservator is obliged to consider the entire context and history of a given item under his/her care and to make treatment decisions that are respectful and accommodating of its history. For example, should it become evident that a particular manuscript did in fact consist of folded quires, a treatment decision may be taken to reconstruct the order of folded folios – though there may also be very good reasons for not doing so.

Rather than viewing the lack of immediate revelations regarding the watermarks found in Timbuktu as failure; it is clear that they may have a use in certain circumstances, for example, in recomposing the manuscript quire order. Regarding the uncertainty of watermarks in identifying the source of paper, maybe we need to look at the

information gathered in Timbuktu as an opportunity to expand knowledge about watermarks. There may be a time when we can better identify watermarks and unlock their evidentiary potential for bibliographic study. Much work is being done on watermarks; there is every reason to continue conducting watermark research. Bearing in mind that our research is at a very early stage and much remains to be learnt – I certainly cannot wait.

Manuscripts, books, bibliophiles and Islamic book culture

Having briefly described above how instrumental Muslims were in the rapid adoption and spread of papermaking technology and of paper itself throughout pan-Islamia I would now like to look at the Islamic book, or manuscript tradition. It is generally acknowledged that the widespread availability of paper made it that much easier to produce one of the important vehicles for the transmission of knowledge in Islamic society - manuscripts. Islamic written culture, particularly during the time of the Middle Ages was by all accounts incomparably more brilliant than anything known in contemporary Europe, until the invention of printing with movable type in the 15th century (Bloom 2001:91). In spite of an absence of printing in Islamic lands the spread of written knowledge there was comparable to and may have surpassed the spread of written culture in China following the adoption of large scale printing in the 10th century.

Not all writing was religious in nature (Bloom 2001:111) any subject from legal and administrative matters to poetry, philosophy, geography, navigation, mathematics, medicine to cookbooks apparently enjoyed considerable popularity as a literary genre (Bloom 2001:112). Bloom further (2001:113) notes:

> Islamic society fostered such a respect for book learning and scholarship that rulers and the wealthy opened their doors to the learned and lavished large sums of money on them. Caliphs, governors, courtiers, gentlemen-scholars and physicians sponsored new books as well as translations of Christian and Jewish works written in Syriac and Greek... People wrote books simply because they wanted to or because patrons or rulers suggested they do so. Writers expected to be paid with honours, presents and often cash. Others, such as secretaries

and judges in state chanceries and offices, wrote books in their spare time."

Numbers of books and manuscripts ascribed to Islamic book production are so immense that they are often, at best, accused of being profound exaggerations. For example, the library of the Umayyad caliph and bibliophile al-Hakam II (Umayyad caliph, r. 961 – 76 CE) was reputed to have contained some 400 000 volumes: however, only one known volume from his library is known to have survived (Bloom 2001:87). Further anecdotes only serve to reinforce a sense of now vanished collections of considerable numbers (Robinson 2003:7):

- the historian al-Waqidi (d. 823 CE) is said to have left no fewer than 600 trunks of books each requiring two men to hoist on his death;
- the essayist al-Jahiz (d. 868 CE) was famously reputed to have been found crushed to death by his books; and
- a 10th century courtier is said to have declined a post on account of the difficulty of moving his library which is said to have included 400 camel loads of books - for the theology titles alone.

Most scholars of Islam do agree that nothing in the contemporary Christian world could compare with the "bibliomania" of pan-Islamia (Bloom 2001:116; Robinson 2003:7). Nor had the long-lived ancient civilisations of Greece and Rome produced anything on a similar scale. For example, in 841 CE the monastery library of St Gall (in modern-day Switzerland) held some 400 volumes; in the early part of the 12th century CE the monastery of Bobbio (in modern-day Italy) held 650 volumes; the riches library in Christendom was reputed to have been the library of the Sorbonne (Paris, France) held a total of 2 066 volumes (with 300 listed as lost). Compared to the library of al-Hakam II (Umayyad caliph, r. 961 – 76 CE) in Cordoba (in modern-day Spain) which is said to have contained 400 000 books; the library's catalogue alone is reputed to have accounted for 44 volumes of 20 folios each. Granted that this figure is probably a somewhat inflated statistic, but bear in mind that even at one-tenth of this number, it would still have been larger than any library in contemporary Christendom (Bloom 2001:120).

The Islamic manuscript structure

The study of the Islamic manuscript structure [28] has received much attention, and has proved worthy of a number of monographs on the subject. The book structure traditionally associated with Islam is that of the codex (Szirmai 2000:51). [29] At the time of Islam's founding, the codex had been around for some five centuries (Bosch 1981:23). The codex seems to have been introduced to Arabia by Ethiopian craftsmen; in the hands of Arabian craftsmen the structure underwent a gradual simplification, but its embellishment soon surpassed anything seen (Szirmai 2000:51). The traditional understanding of Islamic books is that the text blocks are normally sewn and subsequently cased into a cover (Bosch 1981:46). Early Islamic bookbinders adopted the link stitch sewing techniques used in the early Coptic and related binding traditions of the Middle East and Ethiopia. [30]

The structure, materials and techniques that are considered to be the archetypical Islamic binding have:

> remained remarkably constant throughout the Islamic world over time...The folios were collated and assembled in gatherings, which were normally sewn into a single body using a link-stitch... that picks up the preceding gathering... [typically there were two sewing stations per binding, irrespective of the size of the binding]... [T]he coloured [sewing] linen or silk thread was often too thin for its function and [frequently] broke. After sewing the spine was lined, usually with linen... [which] projected beyond the spine ... on either side to form hinges by which the body was attached to the cover boards. After the [text bock] edges were trimmed, end bands were sewn to the head [top] and tail [bottom] of the spine ... The typical Islamic book cover, of leather made rigid with pasteboard, had foredge ... envelope [or pentagonal] flaps. Sometimes flexible covers of skin, paper or cloth were used ... corners were not systematically fixed: sometimes the mitres were lapped; occasionally butted...Islamic bindings often had doublures (linings) of paper, leather or fabric pasted onto the inner face of the upper and lower boards and overlapping the adjacent flyleaf (Turner 1996:356).

Islamic bindings have a distinctive appearance, particularly if the manuscript is closed. The cover forms a wrapper around the book. Only the top (head) and bottom (tail) text edges of the book are visible. A particular feature of the Islamic manuscript cover is the use of a pentagonal (or envelope) foredge flap that results in the books being almost completely enclosed (Bosch 1981:55). In some cases this flap may be secured with a cord or tie that wraps around the entire volume. This tie may by attached to either the apex of the pentagonal foredge flap or the spine (or in some cases both).

The overarching aesthetic consideration of an Islamic manuscript is that it forms of a smooth rectangular block. Muslim craftsmen were inspired by the Chinese books they encountered and tried to replicate them. However, due to differing materials and working techniques something different evolved. The rectangular block was also seen as a vehicle for decoration, both internally and externally, therefore there was little interest in the textures and grains of the materials of leather and paper. In fact, the burnishing of paper was supposed to eliminate any such characteristics. Similarly smooth rather than grained leather was also preferred for the same reason. [31]

The manuscript structure encountered in Timbuktu
Any definitive statements about the general structure of the binding structures to be found in Timbuktu are as yet not possible. The SA Conservation Team has only seen a small fraction of manuscripts from the collections at the Ahmed Baba Centre in Timbuktu. We have had a chance to carefully examine only a handful of bindings at this stage; this is not to say that some generalized observations are not possible - and I would like to share these with you.

Manuscripts as bundles of single sheets
Most manuscripts appear to consist of a number of single sheet pages (leaves). We have established that in the case of some of the manuscripts that it is very possible that these single sheets were originally gatherings (or quires) of unsown folios. It this thus quite conceivable that this may be the case for many of the manuscripts in Timbuktu that they originally consisted of unsown quires, which have separated due to the effects of time, wear and tear and the very dry climate of Timbuktu.

However, on some of the loose leaves in the manuscripts we have found evidence of sewing holes. These sewing holes were not in the spine fold, but just next to it, indicating the possibility that some sort of whip or saddle stitch may have originally been used to sew the manuscript together.

Interestingly we have encountered some paper tear repairs using stitching to keep the two sides together. This technique is a very common older technique for vellum or parchment repair, and features quite strongly in the repair of parchment-based Judaica.

"Wrapper-like" manuscript covers; and ties to secure the manuscripts
The covers of the manuscripts we have encountered are not adhered to the text block in any way – serving rather as a wrapper to the loose leaves of the manuscript. Nor is there any evidence that the text blocks were ever cased into their covers; bearing in mind that many of the covers are significantly worn and/or show signs of extensive renovations. Many of the covers bear evidence of repairs (in leather) of the original cover. In some cases we have observed that the stiffening for the cover is of some sort of thick and stiff hide with a very deep grain patterning; as well as paste board composed of layers of older written paper and textile. Leather covers are decorated with a blind tooling that appears to be of a freehand nature. Our observations of local craftsmen have lead us to think that possibly a wooden tool was used to score the leather, rather than the use of hot stamping tools.

A feature which we have encountered in Timbuktu is the widespread presence (or evidence) of ties to wrap around the cover of the book once it is closed. Where the leather ties have detached, strips of cloth are used to tie a volume together. The placement of the ties seem to be on the spine or foredge of the cover, or on the apex of the pentagonal foredge flap (where in some cases any eyelet made in the cover's corner has been observed, either as a place to anchor a tie or to thread a tie through.) I have as yet not encountered anything in the literature on Islamic binding about such ties.

As I have mentioned the pentagonal foredge flap, which is so closely associated with Islamic bindings, is a feature of the bindings that we have thus far encountered. What initially surprised me though, was

the universal practice of tucking this flap under the upper cover so that it is hidden once the book is closed. In the literature, though I have discovered a mention of this as a general practice (Bosch 1981: 55). Bosch though notes that depictions of the book in Islamic art almost invariably show the flap exposed, as it had become an important symbol in Islamic painting convention. Literature on Islamic binding structure invariably indicates that the foredge flap does close over the front board. Though certainly from what we have observed the practice of closing the flap under the front board is a very strong local practice. It may have something to do with the fact that most of the manuscripts are enclosed in a wrapper cover, rather than having the cover adhered to the text block (which would make the fit between the cover and text block a much tighter one, and would not allow for slipping the foredge flap under the front cover.

In conclusion, I would like to say that in Timbuktu we have an exciting opportunity. This opportunity may not be that in the clichéd role of bibliophilic treasure hunter uncovering uniquely wonderful and singular treasures of amazing illumination and fine binding - though these do exist. But to uncover an even rare treasure, that is, an understanding of the types of manuscripts used by everyday literate persons. There is a principle within bibliographic studies that states that the books that have survived are the rare treasures, precisely because they are more valued they enjoy a greater consideration by the preceding generations. It is the more everyday, mundane and unappreciated volumes used by the average person that tends not to survive because of the fact that they are undervalued documents of everyday life. Therefore, the field of bibliographic studies understands that it is skewed towards a better understanding of the rare, costly and treasured volumes because they form the greater part of the surviving codexical history that modern scholars can access. In Timbuktu we have a unique opportunity to discover a treasure of the everyday working manuscripts used by the everyday scholar and aspirant scholar – while assisting in the preservation of an immense literary treasure indigenous to Africa.

Destruction and loss of manuscripts

The surviving numbers of Islamic manuscripts, set against the numbers of manuscripts recorded in historic documentation are

generally considered to be testimony to the incredible loss and attrition suffered by Islamic manuscripts over the centuries. A salutary tale is that of the fate of al-Hakam II's 400 000 volume-strong library that after his death: the collection was variously destroyed and dispersed by his successor (Bloom 2001:121). A further example that is considered to be not untypical of the fate of many collections: during the 11th century, Cairo's city's libraries were systematically plundered by soldiers and bureaucrats who had gone unpaid by their rulers and paymasters; historical accounts record that 18 000 volumes of science and 2 400 illuminated Korans were taken from the caliph's palace in 1068 CE (Robinson 2003:31).

Dramatic stories of cataclysmic violence against manuscripts aside, manuscripts are lost to posterity for a variety of reasons one of these is due to the medium itself, well made paper is very durable having an estimated lifespan of some 500 years. But paper also has its limits. Extreme unfavourable climatic conditions and the depredations of pests, amongst others can conspire against their survival. Human agency also bears a large responsibility for the loss of manuscripts: they are also stolen, misplaced, destroyed by accident or intent.

Adverse climatic conditions

In Timbuktu the harsh climatic conditions conspire against the continued survival of its many manuscripts. The most important climatic factor is the extremely dry and hot climate (De Villiers & Hirtle 2003:85). Timbuktu's temperatures average from 25° to 35° Celsius in the winter months; and in summer can reach 50° Celsius. This combination of factors, particularly the lack of humidity, causes the manuscript materials, especially the paper to become extremely brittle and thus prone to mechanical damage. [32] Another factor in the area's arid climates are the very hot and dry winds that blow in the Sahara desert and strip what little moisture remains from the air; the most well known (and worst) of these are the winds that blow in November, the *harmattan* winds. Humidity has been tracked falling from 80% to 10% within hours (De Villiers & Hirtle 2003:81). An infrequent climatic phenomenon is that when rain does fall, it evaporates as it forms due to the great heat, and sometimes as it hits the ground (De Villiers & Hirtle 2003:108). This phenomenon creates an instant spell of unusually high humidity. The constant changes in temperature and humidity levels cause paper and leather to continually

expand and contract in response to the climatic changes. Thus it is not only the very high temperatures and lack of humidity, but also the drastic climatic changes that adversely affect the materials of which the manuscripts are composed. It is not a dramatic stretch to say that just about the worst of all conditions possible for the survival of manuscript materials occur in Timbuktu.

Part of the Mali Rare Manuscripts Project's emphasis on Preservation management is to devote a considerable amount of attention to the matter of how the manuscripts are to be stored, and particularly the use of protective enclosures constructed from archival materials which will assist in isolating the manuscripts from their very harsh climate.

Lack of humidity

One of the things I have noticed about the paper in Timbuktu is how light it is, this does not mean that the paper is very thin or lightweight - it means that there is little moisture in the paper. The paper in Timbuktu could thus be described as embrittled: the lack of moisture probably being the largest cause of the brittle state of the paper. The brittle nature of the paper causes the edges of some of the pages to chip away with even the most gentle of handling. The often robustly made manuscript covers impact on the pages, causing the page's edges to be folded back, eventually snapping away from the rest of the sheet.

The conservation team has also tentatively begun to perform conservation repairs to some manuscripts. We have found that the inks are very unstable, requiring very little in the way of moisture to result in movement of the inks; paper too reacts with something akin to shock when exposed to the slightest bit of moisture. The SA Conservation Team is currently working with the Malian trainee-conservators in finessing standard paper repair techniques to suit the needs of the materials and climate in Timbuktu.

Water damage

Despite the description of Timbuktu as a very dry place, many of the manuscripts I have handled have clear and extensive water damage as evidenced by tidemarks, and ink and pigment staining. Much of the moisture-affected paper has lost its sizing and has acquired a

felted appearance and feel, compared to the often highly polished appearance of much of the undamaged paper. Based on the small sample of manuscripts we have seen, it does seem that exposure to fairly large amounts of moisture does occur.

Insect pests

There are insect pests such as termites which can and have caused immense amount of damage to manuscripts. I have seen quite a few manuscripts with once square manuscript text block now sculpted into hills and valleys of paper, creating an almost three-dimensional landscaped effect. It seems that the survival of manuscripts is something of a triumph over considerable climatic adversity as just about all of the worst of conditions for preserving manuscripts are to be found in Timbuktu. [33]

Dust and sand

Dust and sand is everywhere in Timbuktu. Dust and sand are also harmful of manuscript materials as the particles abrade the surface of inks, paper and leather. Many of the manuscript covers are so scuffed and worn that we have difficulty in discerning any cover decoration; and pages invariably feel extremely gritty when handled. One of our challenges has been to stress the importance of good housekeeping in a place where sand is a ubiquitous phenomenon, beyond remarking upon and sweeping it away at first seems to be little more than a Sisyphean task. The delicacy of the manuscript pages, in particular, requires the utmost of careful handling during any dry cleaning process. Dry cleaning will form a very important tool in the arsenal of the Ahmed-Baba Conservation Studio.

Conclusion

In concluding this paper I am going to end on somewhat of a personal note. If there is one thing I will take from this project it will be the partnerships forged between the South African and Malian teams during the Project. As a South African I have been privileged to be able to assist in the preservation of an immensely important part of the world's literary heritage, here in Africa. To assist in a precedent setting project, which is amongst other things the first cultural Nepad project, where Africans are helping fellow Africans to preserve their cultural history is an immense privilege.

I have been benefited not only in being able to transmit my knowledge and skills to fellow Malian conservators, but in learning about the leatherworking traditions of Malian leather craftsmen who comprise members of the Malian conservator-trainee team. I have encountered an astounding book making tradition very different, yet very similar to what I have been used to working with here in my part of Africa - Southern Africa.

While paper remains paper and leather remains leather pretty much the same wherever one finds it I have also been challenged by the extremities of climatic conditions encountered in Timbuktu to devise solutions for obstacles to the continued survival the these manuscripts. The extreme climate has forced the entire Conservation Team to rethink many of the operating assumptions with which we have so comfortably been working with since our student days – and we are better conservators for it.

For example, the SA Conservation Team is working with the Malian trainee-conservators to devise a protective wrapper that utilises the traditional format of the wrapper cover made with leather; but the interior of this wrapper is adapted in that it is lined with archival card and has an additional two extra flaps to allow this hybrid 4-flap cover to completely enclose the text block in an archivally sound manner. The use of leather for part of the wrapper is not only due to respect for tradition, but also has a practical aspect: leather is plentiful in Mali; leather is also a material that has a smooth finish once burnished by craftsmen and will be less likely to pick up and retain sand and dust particles, thus creating a sort of sand paper effect that we have seen with other covering materials used by other well-meant conservation initiatives in Timbuktu.

When the manuscripts of Timbuktu are mentioned, it is almost invariably in the same breath as references to the amazing scholarly and literary heritage contained in those manuscripts. However, there is an immensely interesting and exciting bibliographic heritage that remains to be unlocked. Possibly one of the most exciting things about the bibliographic heritage of Timbuktu is the possibility of unlocking some of the past histories of the relatively ordinary students and scholars who used these manuscripts.

Unlocking the bibliographic secrets of the manuscripts of Timbuktu will help in building an understanding of the economics of the paper, scribal, manuscript/bookmaking and other related trades. The watermarks of the Timbuktu manuscripts too may well have a bigger role to play than that which I am currently able to report. A closer analysis of the inks and pigments, cover decoration and interior decoration remain part of an exiting future in teasing out an understanding of Africa's own book historiography, in order to give it a place in the sun that it so richly deserves.

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Endnotes

1. A number of legends exist as to how Timbuktu came by its name. One relates that the original market was presided over by an elderly woman of considerable ferocity. *Tin'Buktu* in the Tamashek language means "Place of the old woman" (De Villiers & Hirtle 2003:112).
2. The river Niger derived its name from the Tamashek phrase "*gher n-gheren"* meaning "river among rivers" (De Villiers & Hirtle 2003:112).
3. Evidence of the prestige and fame attaching to the empire of Mali (of which Timbuktu was a part of at that time), and its ruler (Mansa Musa) is to be found in the European *mappae-mundi* that was probably the first serious attempt to represent the interior of Africa. One of the earliest European references to Mali and its king is in a map dated 1339 – the so-called Catalan Atlas of Abraham Cresques (Bovill 1958:90, 109; Hunwick 2003:2).
4. For more on the literary heritage of the region, particularly efforts in conserving Mauritania's manuscript heritage, see Werner (2003).
5. The following breakdown was obtained from Saad (1983:70). See Berkey, Sabai and Robinson for more information regarding Islamic scholarship. The Islamic sciences which lie at the core of the Islamic educational process throughout pan-Islamia can be divided into two

categories. The first (and most important) consists of four branches of closely related subject matter, though of varying sources: Quranic exegesis (*tafsir*), traditions of the Prophet Muhammad (*hadith*), jurisprudence (*fiqh*) and the sources of law (*usul*). These four branches share a preoccupation with the governance of society and the conduct of individuals along ideal Muslim lines; and range from ethical standards and direct prescriptions to legal principles and precise laws. The second category of Islamic sciences includes: the fields of grammar (*nahw*), literary style and rhetoric (*balagha*), logic (*mantiq*) and doctrinal theology (*tawhid*). Of these, only grammar was considered to form an essential part of a scholar's education. The remainder (as well as astronomy, history mathematics and medicine) may be included to further refine the scholar's learned capabilities or to earn him a greater versatility in juristic deductions and in Islamic doctrine.

6. Saad (1983:22) further elaborates that scholars in this tradition were the leaders of the urban community of Timbuktu; and served as its representatives and as regulators of its public affairs. In their combined roles as notables and learned elite, the scholars could marshal considerable resources and mobilise wide sectors of the city's population. Naturally, this gave them a dominant voice in the internal affairs of their community. Furthermore, scholars and a common subscription to the tradition of Islamic learning seem to have played a city-wide integrative role which transcended the diverse ethnicity of the city's inhabitants (Saad 1983:33).

7. Berkely (1992:4) continues: that this regard for learning does not imply that every Muslim will or should become a scholar of the religious and legal sciences. Muslim sensibilities (as least as refracted through the writings of the educated elite themselves), placed scholars of the religious and legal sciences at the pinnacle of society and at the vanguard of the forces marshalled to defend Islam against enemies; and to bring order and meaning to its members. Scholars of the religious sciences, especially jurisprudence and the Prophetic traditions were guardians of an organic body of knowledge, the transmission of which largely shaped Muslim culture.

8. I found the following sentiments highlighted in the introduction of a book in which no mention was made of the importance of orality in Islamic learning: "Whether in the form of clay tablet, scroll, codex or volume, there is a sense that the book remains central to culture. In the words of Dr Guy Story Brown, Director of the Bureau of

Educational and Cultural Affairs at the United States Information Agency, 'the idea of culture itself originally emerged in connection with cultivations of learning through the written word ... The idea of *the book* or centrality of writing as a universal human inheritance in a sense involves a fundamental change in the idea of culture, a change that itself is characteristic of modernity, and underlies the ubiquity of books' (Atiyeh 1995:xiv). Within the context of Islamic book culture the manuscript has and still does represent for Muslims a historic and cultural value, despite mass production (Atiyeh 1995:xiv). Compare this with information contained in the following footnote number 9.

9. Berkey (1992:43) writes that the overwhelming preference for transmitting knowledge was through oral transmission in Islamic knowledge transmission. Oral transmission was viewed as the only truly legitimate means of transmitting knowledge which is deeply embedded within Islamic academia (Berkey 1992:24). Berkey (1992:18, 24) notes that this bias was present from Islam's earliest days and has survived to the present; giving Islamic learning a measure of informality by not binding it to a system of formal qualifications obtained from formal institutions of higher learning – allowing for a vitality and flexibility in the study of the Islamic sciences. Therefore, institutions of learning played no actual role in Islamic education; though schools existed as buildings and endowments Islamic law allows no corporate identity to any particular institution. As a consequence, no formal degree system was ever established (Berkey 1992:16). Rather, it was the student's personal connection with his teacher(s) (or *shaykh*) which was of great importance. A person's education was judged not on where it was obtained, but from whom – as students built their own careers on the reputation of their teachers (Berkey 1992:23).

10. Paper is thought to have been invented some time in China during the latter part of the 1st century BCE (Bloom 2001:1, 32). Imperial household records award a patent to an Imperial courtier Tzai Lun around 105 CE. Europe only acquired the technology of paper manufacture by the 11th or 12th centuries CE (Bloom 2001:1). The first paper mill in Europe was established at Fabriano, Italy in 1276 CE; another century passed before a paper mill was established at Nuremburg, Germany in 1390 CE (al-Hassan & Hill 1992:191).

11. Today, a ream has 500 sheets. Originally a ream contained some 480 sheets, or enough to make up 20 quires (that is, booklets of 24 pages each). The modern English word "ream" derived in the first

instance from the Arabic *rizma,* meaning "bale or bundle". From the Arabic word *rizma*: derived the Spanish *resma* (*risma* in Italian, *ries* in German, *ris* in Danish), and eventually the Old French *rayme* (al-Hassan & Hill 1992:192; Bloom 2001:9; Loveday 2001:53).

12. There is an interesting historical anecdote from the much travelled Ibn Battuta who visited Egypt in 1327, illustrating the use of paper as being associated with people of "quality" which Bloom cites in his book (2001:81) on the role of Islam in the history of paper. Ibn Battuta relates that no person could enter the city of Damietta without the governor's seal - persons of "repute" had the seal stamped on a piece of paper which they showed to the gate keepers - all others had the seal stamped on their forearms.

13. Books and manuscripts have been valuable and cherished possessions all through history and it appears to have been no different in Islamic society, despite the continued importance of oral transmission. Despite the immense numbers of books and manuscripts that came into being, there was apparently never a feeling of there being too many books, rather that there was too much knowledge (Rosenthal 1995:33). It was too much knowledge, not too many books that was complained about in ancient times and continued to be complained about through medieval Islam (Rosenthal 1995:35). Despair in the face of an overwhelming amount of existing knowledge was the almost universal complaint and the situation most generally referred to by chroniclers. Since books were expensive scholars, with rare exceptions, had to build up their libraries by copying materials with their own hands (not only at the outset of their careers, but also throughout their lives). Not many were so fortunate as to be able to buy (or inherit) books or have others do the copying for them. It became a matter of pride to either own, or have access to as many books as possible (Rosenthal 1995:36).

14. An *al-warraq* was a person who made a profession from transcribing books. Their interests extended not only to beautiful calligraphy, but in reproducing correctly and exactly the text. The author (also described as a "... great bookworm") al-Jahiz (d. 868 CE) hit upon the idea of hiring booths from the *warraqun* and spending nights reading while locked in the bookshops (Atiyeh 1995:xiv, xv).

15. The colouring of paper was carried out for a variety of reasons: aesthetic effect; symbolic significance (blue was symbolic of mourning, death sentence orders were issued on blue paper in Syria and

Egypt); the reader's comfort (it was believed that reading from white paper was damaging to the eyes). Popular colours included *al* (reddish-yellow), *hinnai* (reddish-orange), *limuni* (lemon green), *fustuqi* (pistachio green) and *nukhudi* (buff) (Loveday 2001:51,52).

16. A degree of standardisation regarding paper sizes emerged in the Middle and Near East: one system created sheets so that the width of one format was equal to the height of the format immediately smaller than it, and half the height of the format immediately larger – this system enabled the simultaneous use of different formats by appropriate folding of the sheets (Bosch 1981:31).

17. Bloom (2001:9) credits the success of the Italian paper making industry to a greater access to water power and a further development of Italian technology that enabled the development of a stronger and cheaper product than was locally available in many Islamic lands. Soon papermakers in Islamic lands were unable to compete with European exports. The oldest paper mill in Europe, named after the town in which it is located in Italy, Fabriano, is still in operation today. The huge importance of papermaking as an industry in Islamic lands was little more than a mere whisper by the 19th century, as the art of papermaking had died out centuries before (Bloom 2001:53). There now remains virtually no reliable evidence, apart from the surviving sheets of paper themselves, that paper was actually ever produced in Islamic lands (Bloom 2001:53).

18. In Tlemcen (now in western Algeria) a noted jurisconsult Abu Abdallah ibn-Marzuq delivered a long *fatwa* (that is, a legal decision) on 21 August 1409. It was titled *Tarqir al-dalil al-wadih al-malum ala jawaz al-naskh fi kaghid al-rum* (Decision ... concerning the permissibility of writing on paper made by Christians). Bloom (2001:87) writes that this historical document is indicative of the fact that Italian paper had now entirely supplanted local production by the beginning of the 15th century: according to the document paper had once been made in Tlemcen, Fez (Morocco) and other Muslim regions of Spain, but now no longer was. Pious Muslims were thus forced to write on European paper containing watermarks they found offensive as they included representations of European Christian iconography such as crosses, or that of living beings. Ibn-Mazuq's decision framed the problem in terms of ritual purity and subsequently argued that writing in Arabic over the idolatrous designs rendered them invisible. Therefore, in writing God's name (and message) on

such papers, replaced falsehood with truth – a situation he held to be analogous to the transforming of a Christian church into a mosque.

19. The name "*Maghrib*", meaning "the West" was given to all lands west of Egypt. In 642 CE Arab inhabitants of Egypt embarked on a westward advance of the Arabs from Egypt (Bovill 1999:57). De Villiers & Hirtle write that somewhere in Libya exists an imaginary north-south line. Despite the fact that the Sahara on either side of this line being indistinguishable from each other, all ancient travellers knew where the divide was (2003:32). When these travellers traversed this line they left the East (*Mashriq*) consisting of Egypt, Mesopotamia, Arabia and the Prophet Muhammad's birthplace – that is "civilised" country - for what was considered to be "frontier" country.

20. The geographic expanse of pan-Islamia created conditions for the expansion of trade activities on a scale that had, until then, been impossible to achieve when the regions were still politically fragmented. From the late 7th century CE till the end of the 12th century the regions falling under pan-Islamia functioned much like a vast free-trade area). That is, commodities produced in one part of the world became available for purchase in other parts of pan-Islamia. In this way a uniformity of consumer goods existed among a large diverse population stretching across a wide geographic area (Hrbek 1988:4).

21. The slow acceptance of paper may be due, in part, to the fact that the provinces of *Ifriqiya* (approximately where modern-day Tunisia is located) and Sicily were centres of parchment manufacture (Bloom 2001:85).

22. The account, described as considerably out of date by Bloom (2001:85) appears in a treatise on bookmaking originating from what is today on bookmaking by Tamim ibn al-Muizz ibn Badis, a prince of a small principality located in modern-day northeast Algeria.

23. The first paper mill established in Spain dates from c. 1056 near the city of Shatiba, now the modern-day Spanish city of Játiva or Xátiva, southwest of Valencia. An Abu Masafya first owned the mill. Further paper mills in Valencia, Toledo and Seville are also mentioned in historical records (Bloom 2001:88). Spanish manufactured paper was highly regarded during medieval times, particularly for the copying of books and was exported throughout the Mediterranean world. It is thus sad that given the importance of paper in Islamic Spain, that its history there has to be reconstructed largely from what remains of the historical record - rather than from actual historical examples of manuscripts and books. This is due largely to

the destruction following the *reconquista* (Bloom 2001:89). The Catholic Church and State ordered the complete destruction of all Arabic manuscripts in order to ensure the elimination of all copies of the Koran. Very few manuscripts survived the book burners.

24. The entry for *watermark* in the Bookbinding and conservation of books: a dictionary of descriptive terminology further clarifies: "...true watermarks are a localized modification of the formation and opacity of the paper while it is still wet, so that the marks can be seen in the finished sheet of paper when viewed by transmitted light" (Watermarks 2004).

25. Watermarks appear to have been a largely European phenomenon. No real equivalent has as yet been found in Islamic manufactured paper. Only in Islamic papers of Spanish origin have something approximating a watermark been found: a zigzag indentation running from the top-bottom of the sheet, or a series of overlapping diagonal crosses. It is surmised that these marks were made with a stylus or brush while the sheet of newly made paper was still wet. These marks are not considered to be true watermarks (Bosch 1981:30; Loveday 2001:53).

26. Badke writes further, that the uncertainties of watermark analysis include: that the same papermaker may have used several different watermarks; the same mark may have been used by the same, or a different papermaker at times separated by decades; other papermakers may have imitated a successful manufacturer's mark; the watermark shape changed gradually as the mould was used, and often following repair; paper was sometimes manufactured years before it was used; existing watermark catalogues (if they even list the watermark you are seeking) were produced from tracings of watermarks allowing for considerable imprecision.

27. One of the problems associated with the study of watermarks is the difficulty of capturing a suitable likeness of the image; many of the techniques in use have considerable limitations. This is due to the fact that the watermark may be obscured by text or print; or partially hidden by a particularly tight book-gutter. One of the more promising developments is the use of digital imaging technology.

28. The Arabic script reads from right to left, resulting in a book-format that is the reverse of what Roman alphabet-based literates are used to – opening at what would be considered the "back" of the book (Bloom 2001:111).

29. The codex book structure consists of rectangular sheets of paper or parchment folded into gatherings (sections) which are sewn together and attached to protective covers. The individual leaves may be written either before or after compilation (Bosch *et al.* 1981:23).
30. See Bosch *et al.* (1981:24) has a detailed breakdown of how the traditionally conceived Islamic book structure was put together. Also see, Szirmai (1999:51 – 61) and Greenfield (1998: 80,83, 88).
31. In conversation: Jasmine Kahn, Book Conservator, Preservation Section, Library of Congress, Washington DC, United States of America (December 2001).
32. Tests performed in nearby Chad (in Bouroukou) measured an evaporation rate of more than 304 inches per year, the highest recorded as yet. In summer the relative humidity is so low that it can be life threatening – at 2.5%. This is compared to the stated "norm" of 30% (De Villiers & Hirtle 2003:85). The Sahara's inhabitants have become so accustomed to water's absence that some have come to look upon flowing water with suspicion; due in part to the occasional ferocious flooding that can accompany sudden downpours. So much so that a distinction is made between rainwater, described as *meyi*, or dead; and well water which is described as *hai*, or life giving. (De Villiers & Hirtle 2003:107).
33. Harris (2004) writes that only recently have bibliographers begun to appreciate that the survival of books is a major issue within the discipline that requires much more study and analysis - especially as the greatest threat to the survival of books are humans. The important question is thus, not to try and understand why so many books have disappeared – rather to understand how it is that the few that have survived have managed to do so. The bibliographer O. M. Willard (c.1940) concluded that as a general rule, the survival of any given book/manuscripts is in an inverse ratio to the number of copies printed. The idea being that that the higher numbers of print runs were aimed at a wider audience, these mass produced items were made of less robust materials and were thus less looked after or valued.