Silk Road or Paper Road?

Jonathan M. Bloom
Boston College

Fig. 1. Han period bamboo woodslip found near Dunhuang, Dunhuang Museum. Photograph © Daniel C. Waugh 1998.

Well over a century ago, the Austrian geologist and explorer Ferdinand von Richthofen (1833-1905) coined the term *Seidenstrasse*, "Silk Road (or Route)" to refer to the network of land routes that linked China and Europe from the 3rd century BCE to the 15th century CE. Silk, which was traded with the West from the later part of the Zhou period (ca. 1050-256 BCE) was only one of the many commodities traded along these routes, for jade had been brought to China from Central Asia as early as the Shang period (ca. 1600 to ca. 1050 BCE), and Mediterranean glassware reached China during the Qin period (221-206 BCE) [Sørensen and Marshak 1996]. Traders brought exquisite Chinese ceramics to Iraq in the ninth century, when it was ruled by the Abbasid dynasty (749-1258), and Islamic underglaze-painted wares as well as Iranian cobalt were taken to China, where they inspired the development of that quintessentially Chinese ceramic technique of blue-and-white porcelain [Carswell 1985]. Perhaps the most important product carried along this trade network, however, was paper, a now-ubiquitous material which has had a far greater impact on the course of human civilization than silk, jade or glass ever had.

Paper, which is a mat of cellulose fibers that have been beaten in water and collected on a screen and dried, was invented in southeastern China in the centuries before Christ [Tsien 1985; Bloom 2001]. Originally used as a wrapping material, paper began to be used as a writing material around the time of Christ, when it was discovered that this relatively inexpensive, strong and flexible material provided an ideal replacement for the narrow bamboo strips or tablets that had been used for writing [Figs. 1, 2] and the silk textiles that had been used for larger images, such as maps and drawings. Although the Chinese initially made paper from refuse fibers, they soon found that they could also make it from the inner bark of several woody shrubs, such as bamboo, paper-mulberry, and rattan that grew well in moist and humid southeastern China, and from then on waste fibers were not normally used in China for papermaking.

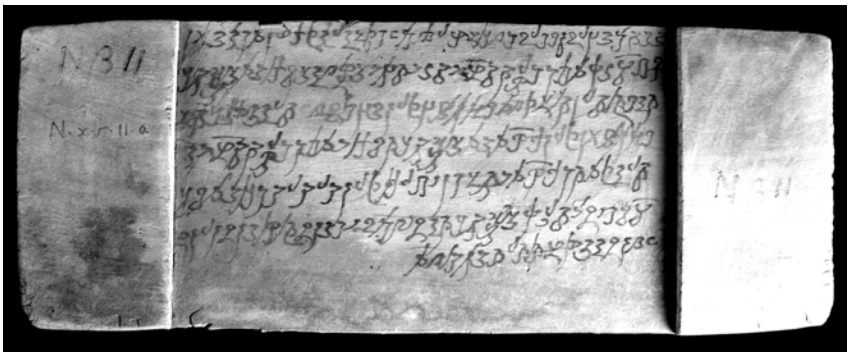

Fig. 2. Land-purchase document in Kharosthi script written on a wooden tablet, found at Niya by Aurel Stein, BL Or.8211/1494 (N.xv.11.a). Photograph © The British Library, used with permission. All rights reserved. See Silk Road Exhibition online at <http://idp.bl.uk/education/silk_road/SR/kroraina/krorainia_fs.htm>, item 76.

Buddhist monks and missionaries, who began to use this medium for copying sutras and other Buddhist writings, carried paper and papermaking from the land of its origin to Korea, Japan and Central Asia, where they stopped on the way to India, the land of Buddhism's birth. The arid Central Asian climate was quite different from that of subtropical southeastern China, and papermakers were forced to find different materials with which to make their product. It seems likely that Central Asian papermakers were the first to discover (or rediscover) that waste from textiles that were themselves made from plant fibers, including linen and cotton but excluding wool and silk (which were animal fibers impossible to use in papermaking), could also make good paper [Hoernle 1903]. Indeed, it was often easier to make paper from previously processed fibers because the fibers required less beating. It is likely that at a relatively early date Buddist travelers also brought paper and knowledge of papermaking to India, but unlike elsewhere, papermaking did not take hold in India for another millennium [Soteriou 1999].

Paper was unknown in Western Asia and the Mediterranean world before the coming of Islam, when the media traditionally used for writing there were papyrus and parchment. Papyrus, which had been used in Egypt from at least 3000 BCE, is made from a plant

Fig. 3. Draft of a petition to the katholicos by Aurelios Ammon, Scholastikos, fl. 348 CE. Duke Papyrus Archive, P.Duk.inv.18R, online at <http://scriptorium.lib.duke.edu/papyrus/records/18r.html>. Photograph © Rare Book, Manuscript and Special Collections Library, Duke University Libraries, used with permission. All rights reserved.

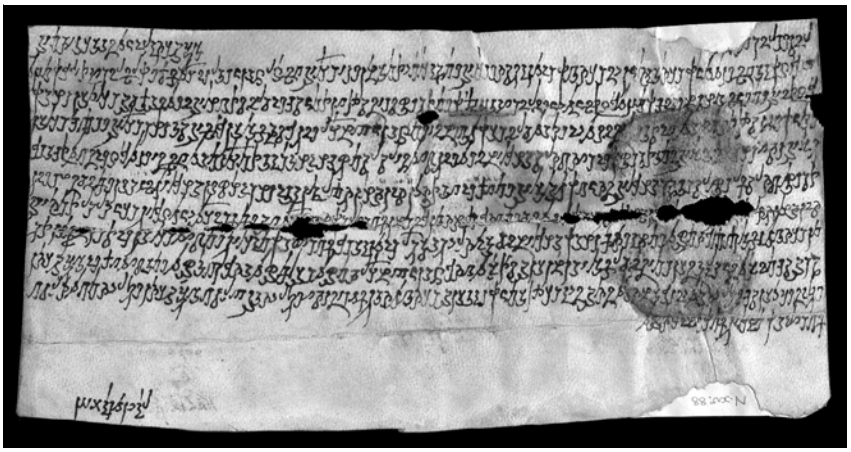

Fig. 4. Letter on parchment from king of Kroraina to local governor in Niya, 3-4 century CE. BL Or.8211/1553 (N.xv.88). Photograph © The British Library, used with permission. All rights reserved. See online Silk Road Exhibition <http://idp.bl.uk/education/silk_road/SR/kroraina/krorainia_fs.htm>, item 141.

that flourishes along the banks of the Nile. The stalks of the plant were cut into lengths, the lengths were cut into strips, and the strips laid side-by-side in two perpendicular layers, held together by the gummy sap exuded by the plant [Fig. 3]. Individual sheets were joined together in rolls, which the Egyptians used right to left and the Greeks, who imported the material, used from left to right. The Greeks called papyrus *khartes*, a word that has been transformed to paper-related terms in many modern languages, including *carta* (Italian for paper) and our own card and chart. The Romans called the plant by the Latin term *papyrus*, which has also been transformed into many other paper-related terms, such as paper (English), papier (French and German), and papel (Spanish). The Greek word for a papyrus roll, *biblios*, has given rise to words from Bible to bibliography, while the Latin term for this same thing, *volumen*, has evolved into words such as volume and volute (on account of its shape). *Pagina,* the Latin term for a column of text on a papyrus roll, has evolved into our word "page," and *liber*, originally the Latin word for bark, became the generic Latin word for book. Although the most common form of the book was the papyrus roll, sometime in the centuries after Christ a new form of book, with separate folded leaves sewn together on one side, emerged. This was known as a *codex*, from the Latin term for a block of wood.

Parchment, which takes it name from the city of Pergamon in western Anatolia, was the other writing support used widely in Antiquity [Fig. 4]. Made from the skin of an animal which had been soaked in lime, scraped of its flesh and hair, stretched on a frame and dried, parchment had long been used by the ancient Hebrews for copying their scriptures, the Torah. The sheets, made from ritually-slaughtered animals, were sewn together to form long rolls on which the text was written. Since an animal had to be killed to make a sheet of parchment, it was always much more expensive than papyrus, but it could be made anywhere (papyrus could only be produced in Egypt). Furthermore, parchment was more durable than papyrus in a wider variety of environments; it was especially strong when used in the codex format, for the repeated folding and exposed edges it demanded weakened papyrus sheets.

The origins of the codex are much debated, and it remains unclear whether the triumph of the codex format in the Mediterranean world was directly related to the spread of Christianity [Roberts and Skeat 1983]. For about a thousand years writing-tablets of wood with a thin overlay of wax had been used for note-taking, composition, and temporary writings, and these tablets were often made in hinged pairs or sets, essentially precursors to the parchment codex. Parchment codices allowed both sides of the writing surface to be used (impossible on a scroll) and made it much easier to refer to a particular passage in the text, because the reader did not have to "scroll through" the entire work to find what he or she was looking for. By the time of the revelation of Islam, the codex format was firmly established in western Asia and the Mediterranean world as the preferred format for books, particularly the Christian Bible, with the notable exception of the Hebrew scriptures, which continued to be copied on parchment rolls, and diplomatic

Fig. 5. Quran on parchment, 8/9th century CE. National Museum, New Delhi 59.187. Photograph © Daniel C. Waugh 2001.

documents, which continued to be copied on vertical-format papyrus scrolls.

The first copies of the entire text of the Quran, which Muslims believe is God's revelation to Muhammad, were transcribed on parchment codices, although papyrus, which was still produced in Egypt (conquered by Muslim armies in 641), continued to be used for bills, letters and records [Khan 1993]. Muslims visually differentiated copies of their scriptures from the Christian Bible by generally using a horizontal ("landscape") format [Fig. 5]. When Muslim armies conquered Central Asia in the late seventh and early eighth centuries, they encountered paper for the first time. It is often said that Muslim armies captured Chinese papermakers following the battle of Talas in 751, but this anecdote is without factual basis and paper had been known—and made—in Central Asia for centuries. For example, archaeologists discovered a mailbag containing letters written on paper and addressed to a merchant in Samarqand in the fourth century [Fig. 6] [Sims-Williams 1987]. Devastich, lord of Panjikent in Sogdia (now Tajikistan) until his capture by the Arabs in 722, left an archive of 76 writings in Sogdian, Arabic and Chinese on leather, wood and paper, which Soviet scholars discovered at the remote site of Kala-i Mug [Zeymal' 1996]. A few decades later in 762 the new Abbasid dynasty transferred the capital of the Islamic empire from Damascus in Syria to Baghdad in Iraq; this new eastern focus, combined with the government bureaucracy's soaring demand for records, led to the introduction and quick diffusion of paper in the Islamic lands.

Papermaking was begun in Baghdad itself by the late 8th century. The city boasted a *Suq al-warraqin* (Stationers' Market), a street whose two sides were lined with more than one hundred shops for paper- and booksellers. From Iraq, papermaking was carried to Syria, then Egypt, across North Africa to Morocco and eventually to Spain, where its use there is first recorded by a tenth-century traveler. The first sheets of "Arab" paper appear in Spanish Christian manuscripts of the late tenth century, where the sheets were substituted for the typical, but more expensive, parchment. Eventually other Europeans learned of papermaking from the Muslims of Spain, particularly as Christians began to occupy larger portions of the Iberian peninsula and needed materials on which to record deeds and titles. Similarly in Sicily and Italy, merchants and

Fig. 6. Sogdian Ancient Letter No. 2, ca. 313 CE, found by Aurel Stein at Watch Tower T.XII.a on the Dunhuang Limes. BL Or.8212/95 R. Photograph © The British Library, used with permission. All rights reserved. Nicholas Sims-Williams' translation of the letter is online at <http://depts.washington.edu/uwch/silkroad/texts/sogdlet.html>.

notaries began to use paper from the late eleventh and twelfth centuries, although papermaking was not introduced, perhaps from Spain or from somewhere in the Arab world, until the thirteenth. Once the Italians learned the art of papermaking, they quickly superseded their masters, producing large quantities of fine paper more cheaply than anyone else, and they began exporting it to North African and West Asian markets.

Few, if any, early Islamic writings on paper survive in their original format, although many of the texts written on them were recopied and preserved over the centuries. Excavations in Egypt show that paper increasingly replaced papyrus over the course of the ninth and tenth centuries; by the middle of the tenth century papyrus was hardly used at all. Meanwhile, paper spurred a burst

of extraordinary literary creativity throughout the Muslim lands. The increased numbers of texts known from the late eighth and ninth centuries in Iraq testifies to a vibrant literary culture in the major cities of the Abbasid realm. As is to be expected, most of the preserved writings from this period concern the religious sciences and auxiliary disciplines such as the history of the Prophet and early Islam, the grammar and vocabulary of the Arabic language, and pre-Islamic Arabic poetry, which helped scholars understand the context for the revelation of the Quran. But new "secular" subjects increasingly find place in Arabic literature of the ninth century, including works on geography, astronomy, medicine, mathematics, and literature. Indeed, the earliest known manuscript version of the popular tales we now know as the *Arabian Nights* was copied in ninth-century Egypt or Syria, a time when other, new types of really popular literature were also inexpensively copied on paper [Abbott 1938; Rice 1959].

Such texts indicate how widespread paper became in this period. It was used not only by Muslims but also by Christians and Jews. For example, the oldest manuscript on "Arab" paper is believed to be a copy of the *Doctrina Patrum*, produced at Damascus ca. 800 [Perria 1983-1984]. Hundreds of thousands of documents dating from the ninth to the thirteenth century that were discovered in the nineteenth century in the *geniza* or storeroom of the Ben Ezra synagogue in Cairo document the growing use of paper among the merchant communities of the Mediterranean lands for letters, contracts, inventories, and deeds [Goitein 1967-1994].

The Cordoban library of the neo-Umayyad caliph al-Hakam II was reputed to contain some 400,000 volumes, many of which must have been copied on paper. Similar libraries are reported in medieval Cairo and Shiraz [Eche

Fig. 7. Manuscript of the Quran on paper, Iran, Shiraz ca. 1560-1575. Museum of Islamic Art, Berlin, MIK I.142/68, open to the end of Sura 113 and beginning of Sura 114. Photograph © Daniel C. Waugh 2004.

1967]. The extraordinary numbers of volumes in them, even if exaggerated by a factor of ten or more, testify to the flowering of written culture in the Islamic lands during the medieval period that was made possible by the spread of paper and papermaking. In Christian Europe, by contrast, manuscript books were rare and costly. The library of a monastery in eleventh-century Constantinople, for example, had only twelve books, of which eight were copied on paper, while the library of the Sorbonne in 1338, said to be the finest library in Christendom, had only 338 books for consultation chained to reading desks and another 1728 books available for loan, although 300 of them were listed as lost [Bloom 2001, p. 117].

The oldest known complete Arabic book copied on paper, dating from 848, was recently discovered in a library in Alexandria, Egypt; the second-oldest fragment is a well-known manuscript dating from 866 in Leiden University Library about unusual terms in the traditions of the Prophet. These two manuscripts are valued for their precise dates, but thousands of similar manuscripts must have been produced. Nevertheless Muslims must have initially viewed paper with some suspicion, because manuscripts of the Quran continued to be copied on parchment well into the tenth century. The oldest dated copy of the Quran transcribed on paper was produced, presumably in Iran, in 971-72 by the calligrapher Ali ibn Shadhan al-Razi, whose name indicates that he came from Rayy, a city located near modern Tehran. These first Quran manuscripts on paper were copied in scripts unlike the stately "kufic" scripts traditionally used for copying the Quran on parchment and more like the cursive scripts used by contemporary scribes for copying literary works on paper. In time it became common to copy the Quran on paper, except in Morocco and Spain, where parchment continued to be used for several more centuries. Over the following centuries, calligraphers continued to develop new and more fluid scripts to copy the Quran and other texts on paper, thereby transforming the art of writing in the Islamic lands [Fig. 7] [Blair 2006].

In the thirteenth century the Mongol conquests in Central and Western Asia once again encouraged trade and communication along the routes linking China to the West, and during the ensuing *Pax Mongolica* men,

materials, and ideas moved back and forth with relative freedom. At this time papermakers in the Islamic lands, particularly in Iran and Iraq developed techniques for making larger and finer sheets of paper which were used not only as supports for magnificent manuscripts but also as for drawings that served as intermediaries between designers and craftsmen. It is tempting indeed to think that the increased east-west communication, documented in a wide range of media and techniques, led to these technical and conceptual developments in the Islamic lands, but the question is not yet settled [Bloom, in press]. Certain techniques, such as the use of pricked drawings and of gridded plans and drawings, can be shown to have traveled across Eurasia from east to west, but the evidence is moot for perhaps the most important technique in this regard: printing, particularly with moveable type. This technique emerged in fifteenth-century Europe seemingly from nowhere, although printing had been used in China since the 8th century [Fig. 8], and printing with moveable type had been used there since the eleventh. As the use of printing in the Islamic lands before the sixteenth century was restricted to a very few situations, none of them involving the production of books, it is virtually impossible to hypothesize any connection—as tempting as it might be—between the development of printing in China and in Europe.

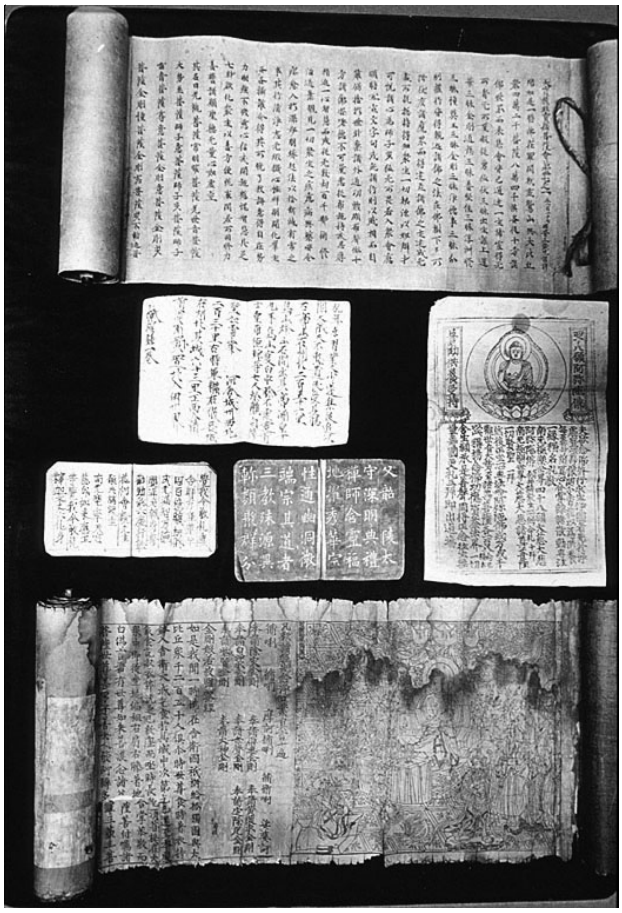

Fig. 8. Manuscripts and prints obtained by Aurel Stein from the "Library Cave," no. 17 of the Mogao Caves at Dunhuang. At the bottom is the earliest complete printed book, a copy of the Diamond Sutra dated 868 CE (BL Or.8210/p.2). Photograph © The British Library, used with permission. All rights reserved.

When Europeans eventually began to investigate the history of paper, they were initially confused because all the words dealing with paper came from Greek and Latin words for papyrus, and they thought that paper must somehow have been derived from papyrus. The first Europeans to encounter Chinese and Japanese papers in the sixteenth century imagined that East Asians had somehow learned to make paper from the ancient Egyptians. Eventually the matter was cleared up, but the pivotal role of the Islamic lands in the transmission of papermaking from Asia to Europe was forgotten. Von Richthofen was surely correct that the trade routes linking China to West Asia and the Mediterranean world played a crucial role in human history, but he was wrong to think that silk was the most important good traded along those routes. This brief investigation into the history of one of the most important, but least appreciated, materials carried across Eurasia suggests that it might be time to modify his original idea to reflect the relative importance of the goods and ideas exchanged alone these routes. In that case, the network would be more accurately known as the Paper Route.

About the Author

Jonathan Bloom shares the Norma Jean Calderwood Professorship of Islamic and Asian Art at Boston College with his wife Sheila Blair. His many publications include *Paper before Print* (2001), *Early Islamic Art and Architecture* (2002) and the forthcoming *Arts of the City Victorious: The Art and Architecture of the Fatimids*. Among the books he has co-authored with Professor Blair are *Islam: A Thousand Years of Faith and Power* (2000) and *The Art and Architecture of Islam: 1250-1800*, a volume in the Pelican History of Art which appeared to rave reviews in 1994. He may be reached at <jonathan.bloom@bc.edu>.

References

Abbott 1938

Nabia Abbott. "A Ninth-Century Fragment of the 'Thousand Nights': New Light on the Early History of the *Arabian Nights*." *Journal of Near Eastern Studies*, 8/3 (1938): 129–64.

Blair 2006

Sheila S. Blair. *Islamic Calligraphy*. Edinburgh: Edinburgh University Press, 2006.

Bloom, in press

Jonathan M. Bloom. "Paper: The Transformative Medium in Ilkhanid Art and Architecture." In *Beyond*

the Legacy of Genghis Khan. Ed. Linda Komaroff. Leiden: E. J. Brill, in press.

Bloom 2001

Jonathan M. Bloom. *Paper Before Print: The History and Impact of Paper in the Islamic World*. New Haven: Yale University Press, 2001.

Carswell 1985

John Carswell. *Blue and White: Chinese Porcelain and Its Impact on the Western World*. Exhibition Catalogue. Chicago: The David and Alfred Smart Gallery, University of Chicago, 1985. See also his *Blue & White: Chinese Porcelain around the World* (Chicago: Art Media Resources, 2000).

Eche 1967

Youssef Eche. *Les bibliothèques arabes publiques et semi-publiques en Mésopotamie, en Syrie et en Égypte au moyen age*. Damascus: Institut français de Damas, 1967.

Hunter 1974

Dard Hunter. *Papermaking: The History and Technique of an Ancient Craft*. New York: Dover, 1974 (original ed. 1943).

Goitein 1967-1994

S. D. Goitein. *A Mediterranean Society*. Berkeley and Los Angeles: University of California Press, 1967–94.

Hoernle 1903

A. F. Rudolf Hoernle. "Who Was the Inventor of Rag-Paper?" *Journal of the Royal Asiatic Society*, 43 (1903): 663–84.

Khan 1993

Geoffrey Khan. *Bills, Letters and Deeds: Arabic Papyri of the 7th to 11th Centuries*. Edited by Julian Raby. The Nasser D. Khalili Collection of Islamic Art. London: The Nour Foundation in association with Azimuth Editions and Oxford University Press, 1993.

Perria 1983-1984

L. Perria. "Il *Vat. Gr.* 2200. Note codicologiche e paleografiche." *Revista di Studi Byzantini e neoellenici*, n.s., 20–21 (1983–84): 25–68.

Rice 1959

D. S. Rice. "The Oldest Illustrated Arabic Manuscript." *Bulletin of the School of Oriental and African Studies*, 22 (1959): 207–20.

Roberts and Skeat 1983

Colin H. Roberts and T. C. Skeat. *The Birth of the Codex*. London: Oxford University Press for the British Academy, 1983.

Sims-Williams 1987

N[icholas] Sims-Williams. "Ancient Letters." *Encyclopaedia Iranica*. Ed. Ehsan Yarshater. Vol. 2. London; New York: Routledge & Kegan Paul, 1987, pp. 7-9.

Sørensen and Marshak 1996

Henrik H. Sørensen and B[oris] Marshak. "Silk Route." *The Dictionary of Art*. Ed. Jane Turner. Vol. 28. New York: Grove, 1996, pp. 718-723.

Soteriou 1999

Alexandra Soteriou. *Gift of Conquerors: Hand Papermaking in India*. Middletown, NJ: Grantha, 1999.

Tsien 1985

Tsien Tsuen-hsuin. *Paper and Printing*. Science and Civilisation in China. Ed. Joseph Needham. Vol. 5, pt. 1. Cambridge: Cambridge University Press, 1985.

Zeymal' 1996

T. I. Zeymal'. "Kala-i Mug." *The Dictionary of Art*. Ed. Jane Turner. Vol. 17. New York: Grove, 1996, p. 735.

Northwestern and Central Iran