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The conservation of parchment
Christopher S. Woods **checked**

Bảo quản giấy da thú (giấy da dê)

20.1 Introduction

This chapter describes the nature of parchment and its characteristics, in particular those that have a direct influence on its preservation and conservation. The different forms in which parchment has been used are summarized, and features of these that influence preservation are included. Also included is a review of conservation treatments and how they have developed. The intention is not to go into significant depth in any of the areas covered, nor to recommend any specific practice (although a cautious and sensitive approach is encouraged). Instead, the purpose is to introduce the reader to the subject and offer some direction for more detailed study or guidance.

Parchment has been used in a number of ways since it was first produced. A precise definition of parchment is probably: animal skins that have been dried under tension to produce a stiff, sheet material with a flat, even surface. Skins of this type have been found dating from around 2800 years ago. Parchment produced using a lime bath in its preparation, as described in Chapter 19, appears in recipes written as early as the eighth century (for example, the Lucca manuscript, Codex 490 ff. 21–25) (Reed, 1972: 33) and Byzantine parchment of the sixth century has been defined as limed skin (Wächter, 1962). Parchment-type skins have been used in a variety of ways, but the great majority of parchment made over the centuries has

20.1 Giới thiệu

Chương này mô tả bản chất của giấy da thú và các tính chất của nó, đặc biệt là những tính chất có ảnh hưởng trực tiếp đến việc bảo quản và lưu giữ sản phẩm. Bài viết tóm tắt các dạng giấy da thú khác nhau đang được sử dụng, cũng như những đặc tính của chúng có ảnh hưởng đến việc bảo quản. Tương tự, chúng tôi cũng trình bày tổng quan các phương pháp bảo quản cùng với quá trình hình thành và phát triển của chúng. Mục đích của bài viết không phải là đi sâu vào bất kỳ nội dung nào, cũng không khuyến nghị bất cứ hành động cụ thể nào (mặc dù chú trọng những phương pháp thận trọng và chính xác). Thay vào đó, mục đích của chúng tôi là giới thiệu cho người đọc chủ đề này và định hướng để người đọc có thể nghiên cứu chi tiết hơn hoặc tham khảo các hướng dẫn.

Giấy da thú đã được dùng theo nhiều cách khác nhau kể từ khi được sản xuất lần đầu tiên. Định nghĩa chính xác về giấy da có thể là: Da động vật được làm khô trong điều kiện kéo căng để tạo ra vật liệu dạng tấm, cứng có bề mặt nhẵn và phẳng. Theo nghiên cứu da loại này có niên đại khoảng 2800 năm trước đây. Trong quá trình chế tạo giấy da thú người ta sử dụng một thùng vôi (xem chương 19), theo công thức được biên soạn vào thế kỷ 19 (chẳng hạn the Lucca manuscript, Codex 490 ff. 21–25) (Reed, 1972: 33) và giấy da ở Đông La mã vào thế kỷ mười sáu được gọi là da ngâm vôi (Wächter, 1962). Các loại giấy da động vật đã được sử dụng theo nhiều cách khác nhau, nhưng trong những thế kỷ trước, phần lớn giấy da được dùng làm để bản thảo (xem hình

been used as a manuscript substrate (see *Figure 20.1*). As a consequence of this predominance, this chapter devotes most attention to the conservation of parchment in manuscript formats, but it also includes a summary of parchment used in other formats. The intention is to make conservators and others aware of the likely places where this type of skin material can be found and to alert them to its characteristics.

There is a large body of published material on the topic of parchment and its variations, in several languages, covering many aspects of science and conservation and published over a period of more than 150 years (not including the many recipes for production described over the last 1300 years). In preparing this chapter the author has reviewed over 100 texts from the nineteenth century to the present, most of them English language publications and translations. The author regrets that many more could not be included, but hopes that the references and citations will be useful as a select bibliography.

20.2 Parchment production and use

The English word ‘parchment’ is understood to derive from the French *parchemin* and the Latin *pergamentum*, which in turn derives from the name of the Hellenistic city Pergamon of Mysia (Bergama in modern Anatolia, western Turkey), once believed to be the birthplace of parchment making under the second century BC King Eumenes II.

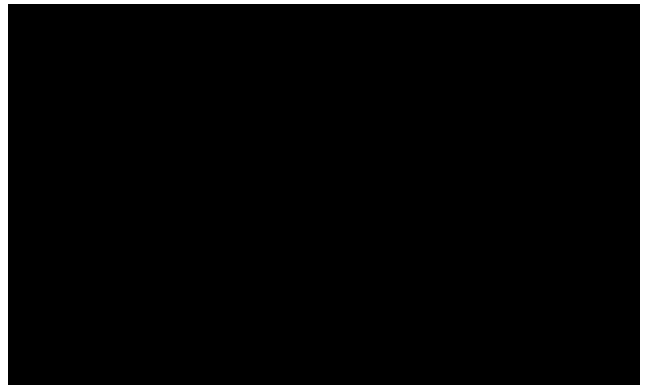
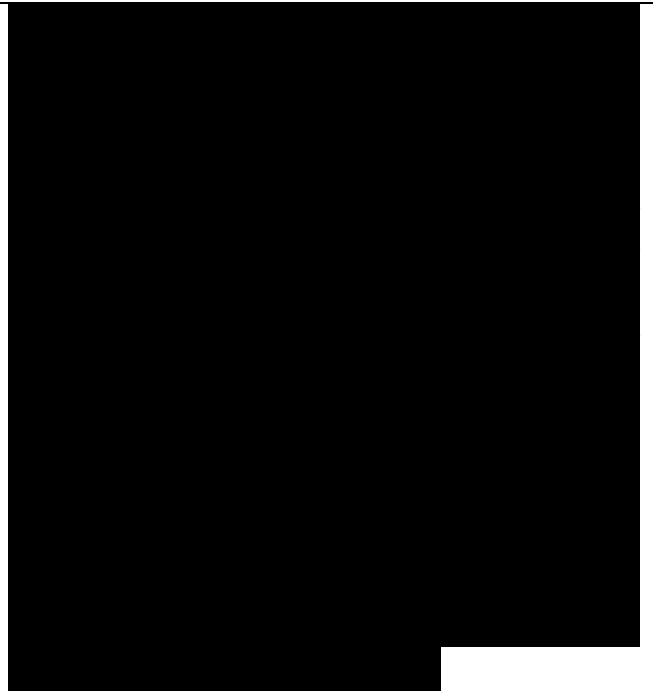
20.1) (nền viết bản thảo, vật liệu viết bản thảo). Do hệ quả của ưu thế này, chương này tập trung vào vấn đề bảo quản giấy da ở dạng bản thảo, đồng thời cũng đề cập vắn tắt đến giấy da ở những dạng khác. Mục đích là giúp những người bảo quản cũng như những người khác biết được những nơi xuất hiện loại vật liệu này và cho họ biết những đặc tính của nó.



According to Pliny (himself quoting earlier sources), *chartapergamene*, or ‘paper of Pergamon’, was supposedly invented in response to an Egyptian embargo on the supply of papyrus to the city (Diringer, 1982). However, the oldest examples of parchment appear to be fragments of camel skin found in the Hebron region of modern-day Jordan, dating from around the eighth century BC and much earlier than that which we associate with Pergamon (Reed, 1972: 118, 277). Skins are recorded as being used for writing purposes as early as the Egyptian Fourth Dynasty (c.2700 BC) (Ryder, 1991).

Figure 20.1 There are many millions of sheets of parchment stored in archives across western Europe in the form of deeds and charters, dating from about the tenth century AD to the twentieth. The above English document, from the reign of Queen Anne, is very typical, being a composite object made of printed and manuscript inks on limed sheepskin, with red shellac applied seals, a blue paper duty stamp with metal strip, and other endorsements. (Courtesy Dorset Archives Services)

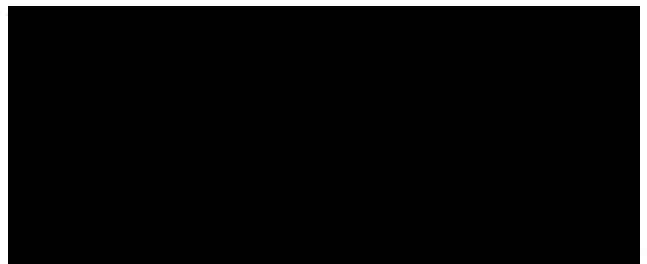
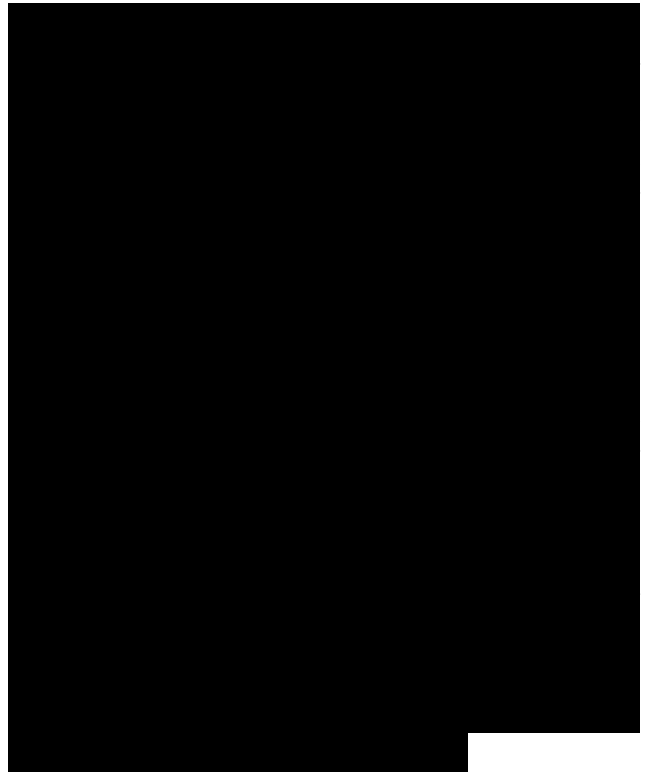
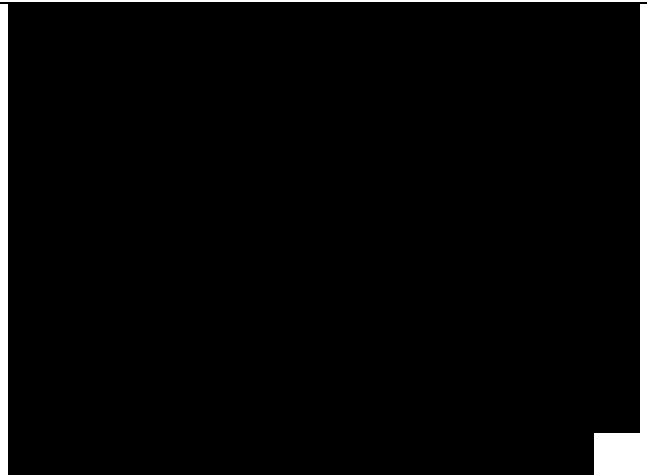
Material from these periods is understood to have been produced by stretching and drying skins, sometimes with the addition of vegetable or fruit infusions that had a light enzymatic or tanning effect (Reed, 1972: 72–120; Haran, 1991). The Dead Sea scrolls from the Qumran caves are perhaps the most well known of such material and are



dated at around 2000 years old. Having been tanned, these might be described more accurately as leathers, but for the fact that they have probably been dried under tension to produce a writing surface. This type of skin, referred to in Aramaic as *gewil*, was not usually 'split' in the way that we may associate with most parchment, but remained the full thickness of the hide.¹ The hairs were removed and the hair side was used for writing since it was smoother than the largely untreated flesh side (Vorst, 1986).

From the second half of the first millennium AD, liming appears to have become a common feature of parchment making, with the possible exception of Hebrew Talmudic parchment, which seems to have begun to be made using a liming process from about 1100 AD (Vorst, 1986). The untanned skins of sheep, goats, calves and deer have all been used to make limed parchment and there remains some inconsistency in common terminology used for any or all of these. In this chapter the term parchment is used for all of these different hide types and the term vellum is used in its precise form as parchment made from calfskins. The term membrane is also used from time to time to mean a single sheet of parchment of any form.

It is not clear where or how skins began to be limed in preparation for parchment production, whether it began in Islamic or European culture. It is argued that Arabs may have adopted the practice from European sources and added it to

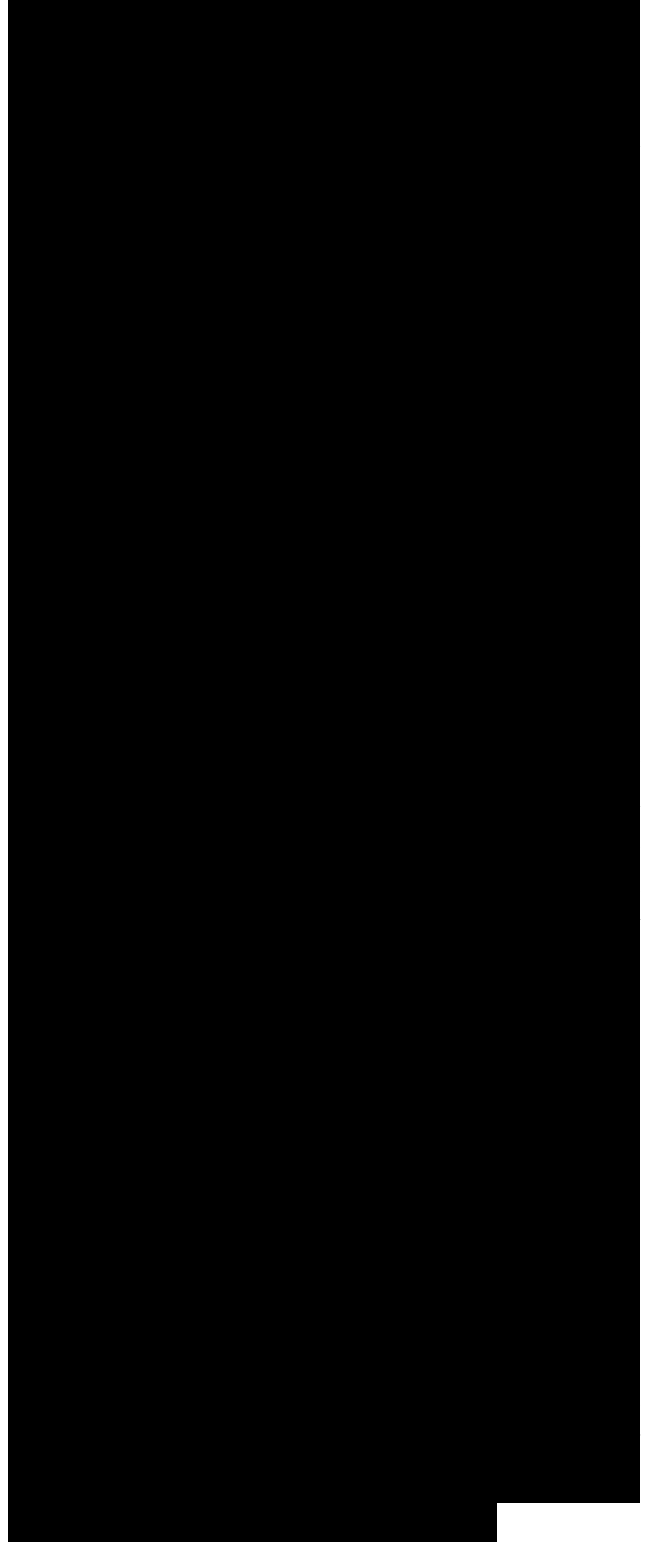


their existing procedures (Haran, 1991). It has been pointed out that the use of an alkaline process was easier to control in colder climates, where the process could continue for longer periods without the rapid deterioration of the fibres that would be experienced in temperatures above 85°F, a temperature regularly exceeded in the Arab countries of Asia Minor, and where a plentiful supply of cold water for cooling the skins may not have been readily available (Vorst, 1986).

The use of lime in the preparation of parchment skins had the advantage of opening up the skin fibres in such a way that they could be pulled more effectively into a flat weave structure. It also produced a pale grey or strong white colour, as compared to the light brown or yellow colour produced by tanning processes. An even, flat surface and white colouring both lend themselves well to manuscript production. Paper began to be made in the Islamic world several centuries before the Europeans (around the seventh century AD). Papyrus had been more commonly used for Islamic writing material, parchment being used for specialist purposes. A rapid expansion in the demand for writing materials from the eighth century AD onwards required a more readily available material. Paper could meet this demand, and by the middle of the tenth century AD it was in widespread use throughout the Islamic world (Loveday, 2001). In western European countries, parchment appears to have been the only writing material used until paper began

to be common in the fourteenth and fifteenth centuries, and it continued to be used for many purposes for another 400 years after that time.

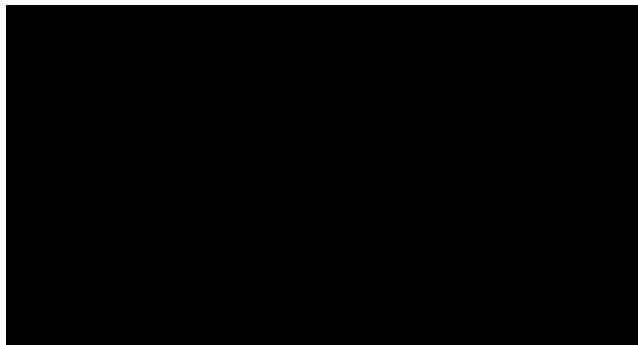
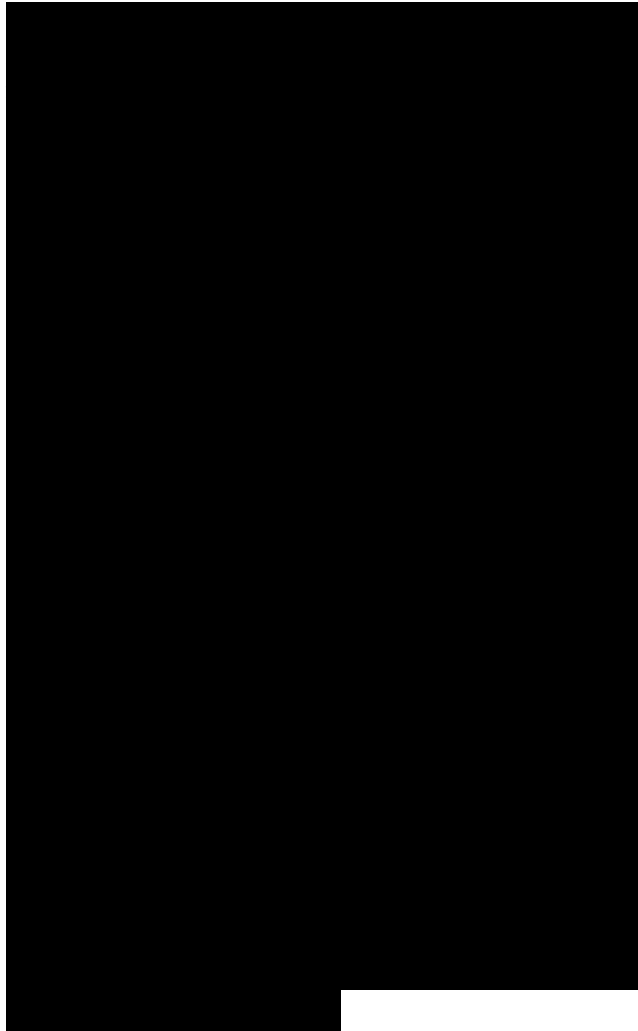
The method of producing limed parchment outlined in Chapter 18 is a fairly standard approach, used in similar ways for several centuries and until modern times. The period when parchment use was predominant in Europe, and when its production qualities were probably at their highest, was arguably between the tenth and sixteenth centuries AD. During this period it was used for ecclesiastical texts, for legal and financial records and those of the royal courts, and for the covers of books. Its production in the United Kingdom during the last three centuries has been most commonly intended for use as legal documents, Acts of Parliament, certificates and awards, for drumskins and parts of other musical instruments, and for specialist works of art. The use of parchment is believed to have spread to India in the tenth century AD, probably via Muslim invasions. However, it never really took hold as a writing material and is more commonly found as a substrate for paintings and ink drawings and in musical instruments, dating from about 1600 AD onwards (Gairola, 1958; Lokandum and Chaudray, 1991). Parchment-like material was also used to make shadow puppets, pots and vessels and more recently in linings for shoes, as a support in clothing and in some sports equipment (Lokandum and Chaudray, 1991).



The three basic layers of a skin are the epidermis or hair side, the middle corium layer, and the inner flesh side. These are different for each animal type. For fine writing purposes, it is the corium layer, in particular from sheep, goats and very young calves, which provides the best surface characteristics. There remain differences between each side of each layer, however. The hair side of the corium has a slightly harder and shinier surface than the flesh side, which has a softer, smoother surface, and is often more fibrous in appearance. When preparing a skin for parchment, its use informs the extent to which a side is scraped, or which layer is split off for use,

to produce either a 'hair-split' or a 'flesh-split' skin. The 'hair-split' has more of the epidermal (hair) layer present, the flesh side having been scraped away to a greater extent. A 'hair-split' parchment is often thicker, has a harder surface on the hair side and can be strong enough to be used for book coverings, for example. A 'flesh-split' skin has had more of the epidermal side removed and is a softer, often thinner material suitable for use as a writing material.

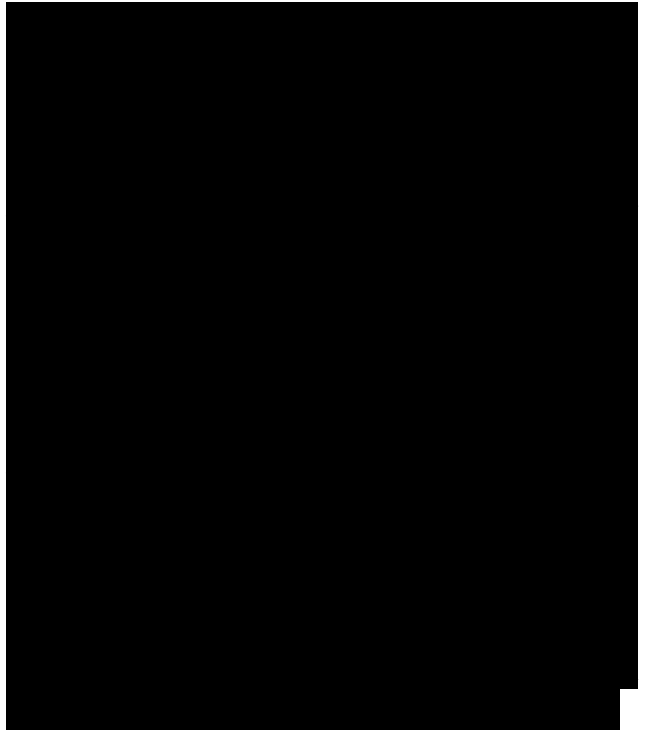
In developing its use as a writing material, different surface characteristics were used to meet specific needs. As mentioned above, very early parchments were not split; the only surface smooth enough to receive writing was the hair side. After several centuries, the surface qualities began to be refined. Both sides



were scraped, with more of the hair side removed, and the thin, smooth material produced by later processes could receive ink on either side and on both at the same time, which became an essential feature for book production. However, western European documents such as indentures, charters and deeds, etc. were usually written only on one side, almost invariably the flesh side.

The standard use of the flesh side for document writing appears to have had an effect on the different qualities of the sides of this kind of parchment material over succeeding centuries. Whereas both surfaces of earlier, refined parchments were good enough to write upon, the hair side of later ones used for documents is so shiny and hard that it would have been more difficult to use it for writing.

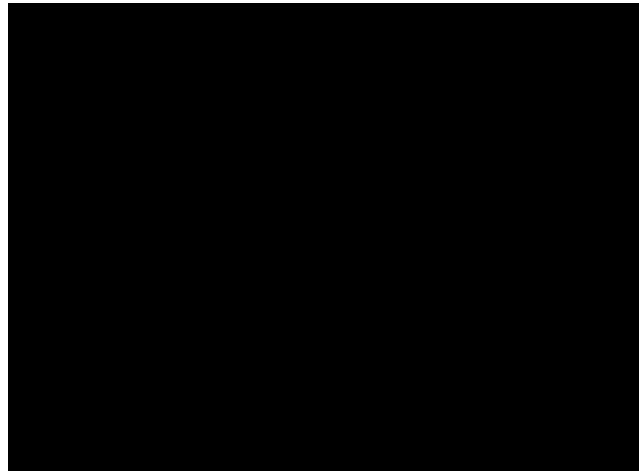
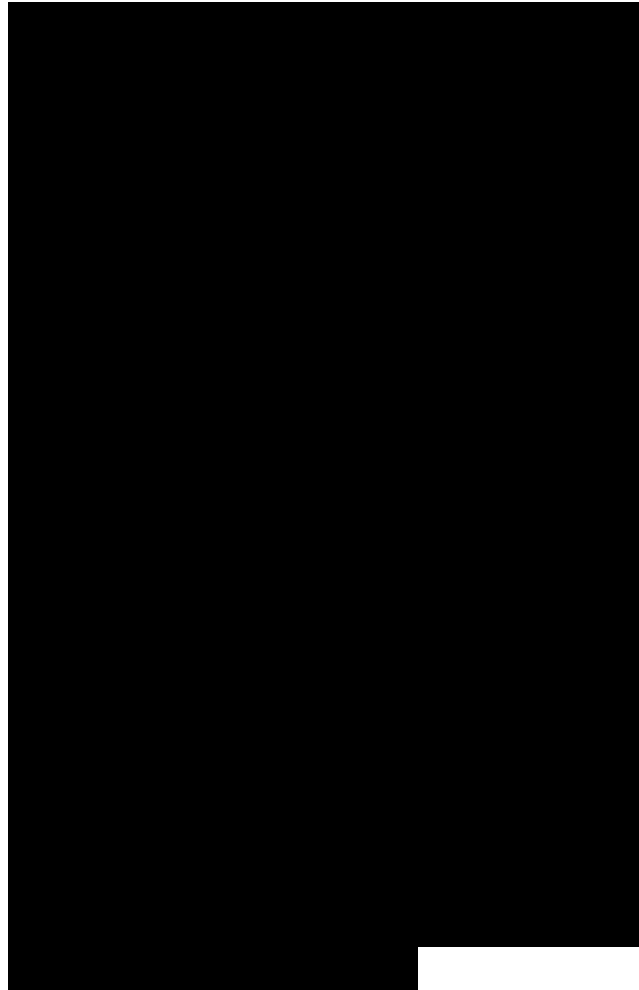
This difference might be because the preparation of much early European writing parchment was intended for use in ecclesiastical settings (where texts were often bound and both sides required). The gradual increase in demand for parchment in legal and court settings resulted in a separate, secular industry producing and supplying material more suited to these different purposes. Over the centuries, the production methods and quality of parchment produced for standard documents altered, particularly between the seventeenth century and the late nineteenth century. Later skins tend to be more rigid, the hair side can have a



pronounced waxy feel and they have slightly different behavioural characteristics (Calabroet *al.*, 1986).

Finely split, limed vellum was used in western Europe as a writing material from early times. It appears, however, that sheep and goat skins gradually became the more common writing parchment materials, particularly those used for secular purposes from about the fourteenth century. Vellum from this period onwards is perhaps more commonly associated with book coverings. For this purpose it was not split to the same extent as sheep or goat writing parchments. The hair-split provided the maximum strength and resistance needed to make a robust protection for text blocks. Its use as a book covering was commonly in a format without boards known as 'limp binding' and from the eighth century to the seventeenth a wealth of styles were used in this fashion throughout Europe, in leather as well as vellum (Scholla, 2003). These limp bindings were used for manuscript texts, first on parchment and subsequently on paper.

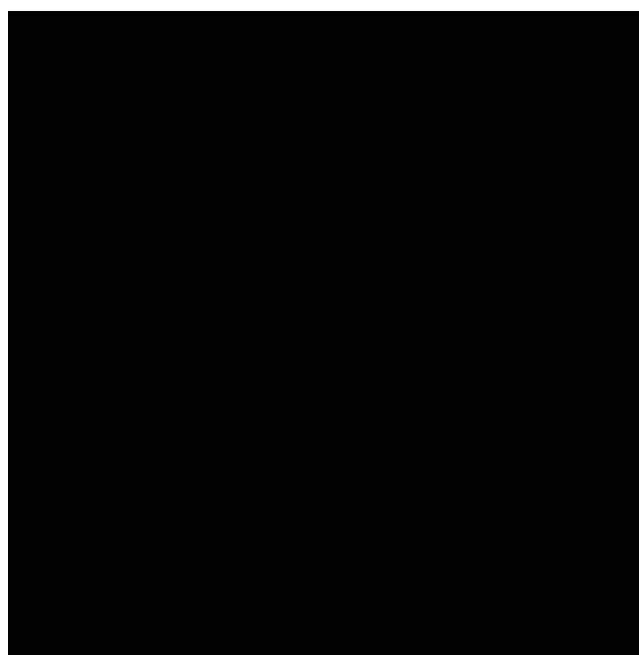
In the UK, stationery bindings (blank books used for accounts, for example) were commonly produced in limp format from the fifteenth to the eighteenth century, and frequently vellum covers were added to gatherings of paper records once a suitable quantity was reached. From around 1700 vellum was also used as an adhered covering on boards for ledgers and other 'hardback' stationery bindings. In early nineteenth



century England, for example, church registers of baptisms, marriages and burials became standardized, the first such consisting of printed pro-forma pages sewn into boards covered with adhered vellum, including green vellum (see below).

The flesh-split was also used for these and other coverings, for both manuscript and printed texts. A flesh-split covering can often be distinguished by a paler colour and somewhat grainy appearance, compared with the common yellow-brown and shinier surface of the hair-split covers. Flesh-split covers have often become weak and torn, especially along the joint and spine exposed to sunlight. Frequently, older vellum and sometimes writing parchment (often musical manuscript or legal documents) were reused for the covering of manuscript texts. The finer parchments of this nature are frequently found to be damaged, being unsuited for this purpose.

Surface characteristics of parchment sheets were altered further by the preparation used by the scribe or illuminator, such as 'pouncing' with powdered pumice, the application of light vegetable oils, or polishing. Different methods of preparation were used in different parts of Europe (Bykova, 1993). Surfaces that were intended to receive layers of pigment or gold leaf were frequently prepared further, sometimes coated with a mineral 'ground' such as gesso or bole. These different surface characteristics all affect the ways in which parchment responds to



its environment.

Parchments were rarely coloured for use, although manuscript membranes were sometimes whitened further with chalk. Skins sometimes had a patterning or colour caused by the presence of blood in the vascular system. If the animal had died of natural causes, or if the carcass was deliberately beaten before being flayed, iron and other residual blood products remained in the skin and membranes causing strong patches of brown 'staining'. Byzantine and Arabic parchments intended for particular purposes were sometimes dyed yellow (with saffron) and in rare cases a blue-black, using dyes from the murex shellfish (Bloom, 1989). In eighteenth century Europe, vellum was sometimes dyed with copper to produce 'green vellum'. This was most commonly used for stationery binding covers, for wallets and for small notebooks that often incorporated a pouch or pocket.

Other uses for both limed and other untanned, split-skins include its incorporation in western clothing (Kite, 1992) (see *Figure 20.2*), in furniture (especially the work of Carlo Bugatti) (Giovannini, 1999; Munn, 1989), as a decorative surface covering for eighteenth century telescopes (often green vellum), and as the support material for seventeenth and eighteenth century fans (Hermans, 1992). American Indian and Inuit cultures used split sealskin for kayaks and seal gut for clothing and bags and in African cultures

a similar material was used for musical instruments (Dignard, 1992; Kaminitz and Levinson, 1988).

Ethnographic artefacts from all over the world often incorporate untanned skin material, such as shrunken heads, mummified bodies (those which do not involve tanning-type preparations) and costumes decorated with pelts or even whole animals. Many of these various items may not constitute what we commonly think of as parchment, but their qualities as untanned collagen membranes give them similar characteristics to parchment, and their conservation frequently involves similar considerations to those used for manuscripts (see Chapter 17).