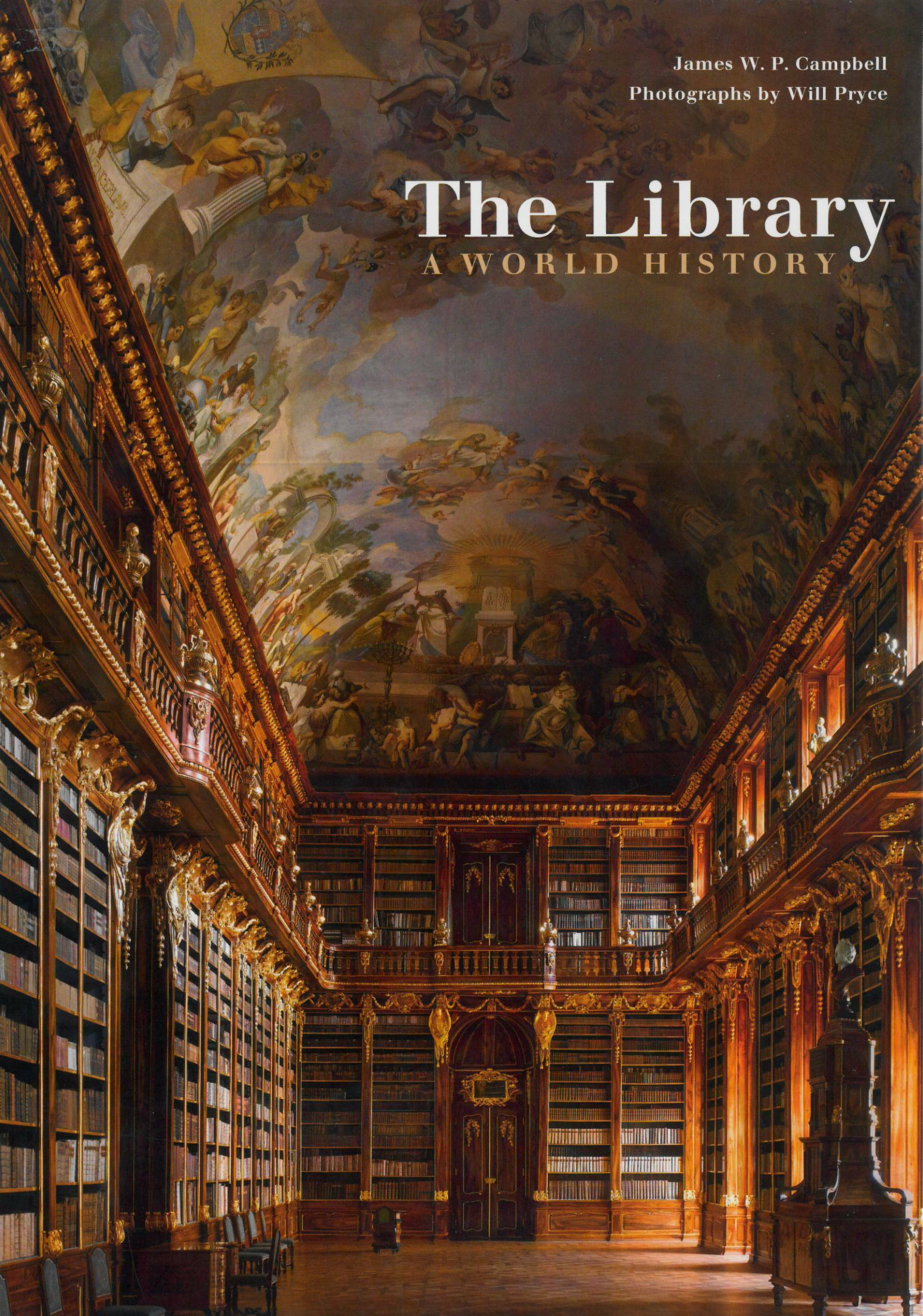


James W. P. Campbell
Photographs by Will Pryce

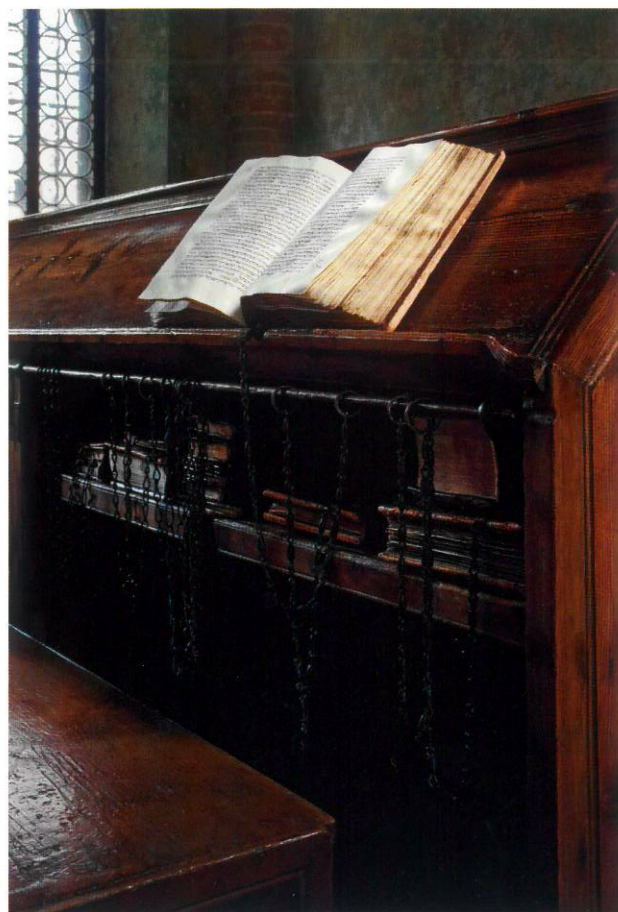
The Library

A WORLD HISTORY



The Library

A WORLD HISTORY



Contents

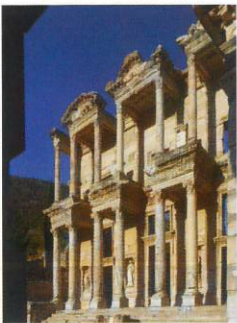
Preface 15

Introduction 18

CHAPTER ONE 36

Lost Beginnings

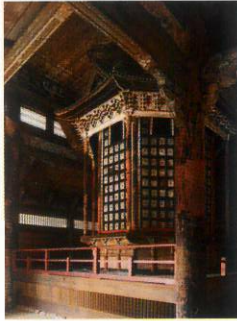
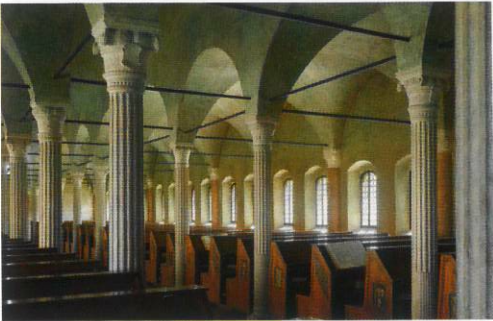
Libraries in the Ancient World



CHAPTER TWO 60

Cloisters, Codices and Chests

Libraries in the Middle Ages



CHAPTER THREE 90

Cupboards, Chains and Stalls

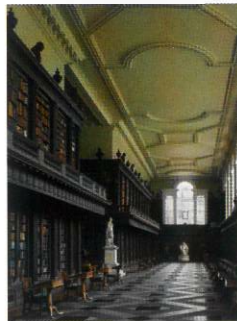
Libraries in the 16th Century



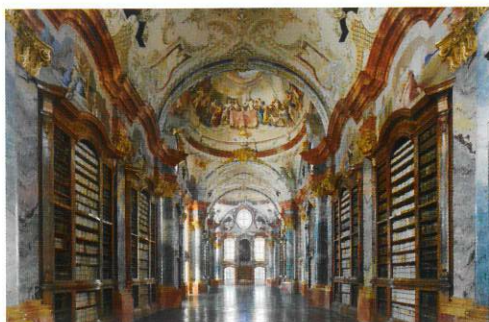
CHAPTER FOUR 120

Walls, Domes and Alcoves

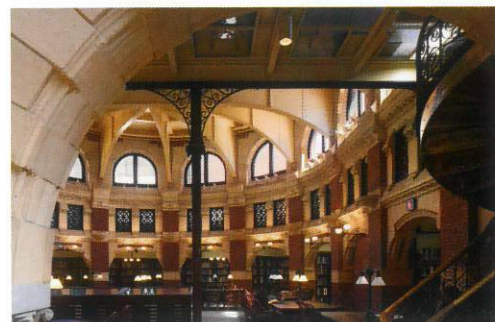
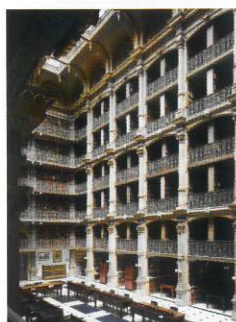
Libraries in the 17th Century



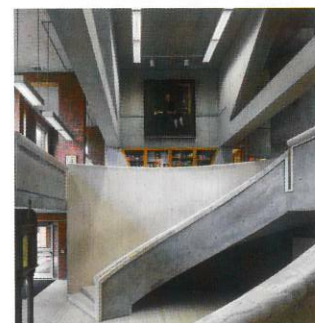
CHAPTER FIVE 152
Angels, Frescoes and Secret Doors
 Libraries in the 18th Century



CHAPTER SIX 208
Iron Stacks, Gaslights and Card Catalogues
 Libraries in the 19th Century



CHAPTER SEVEN 248
Electricity, Concrete and Steel
 Libraries in the 20th Century



CHAPTER EIGHT 288
The Future of Libraries
 in the Electronic Age



Notes	318
Bibliographical Essay	321
Illustration Credits	324
Index	325

Preface

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The idea for this book first occurred to me when, as an architecture student, I wrote a dissertation about the Radcliffe Camera in Oxford. Naturally, I started by looking for a book that surveyed the whole history of library architecture. Then the only significant works in English were J. W. Clark's *The Care of Books*, published in 1901, and the excellent, but relatively short, chapter on the subject by Nikolaus Pevsner in his *A History of Building Types* (1976). When, twenty years later, I still could not find such a book, it seemed permissible to write one myself.

The irony is that today we are told that the book, and hence the library, is under threat. So will this study serve merely as a memorial to a defunct building type? Perhaps, but not quite yet. Today more books are being printed each year than ever before. While public libraries are being closed in Europe, other parts of the world, such as China, are building them. The sales of physical books are increasing, not diminishing: 229 million books were sold in the United Kingdom alone in 2010, a huge increase on the 162 million sold in 2001. Perhaps the world will switch entirely to digital books in the future, but in the meantime an unprecedented volume of physical books must be stored. What is changing is the role of libraries, and as a result the architecture of libraries needs to change with it. It is tempting to assume that this need for change is new;

that until recently libraries have been relatively static in their form. The central argument of this book is that this has never been the case: the history of libraries has been a story of constant change and adaptation.

Any book on architectural history is entirely dependent upon its illustrations, so I was delighted that Will Pryce agreed to photograph the entire project from scratch. Together he and I have travelled to eighty-two libraries in twenty-one countries. I have spent countless happy hours researching the history of libraries in libraries and have been lucky enough to visit many not normally accessible to the public. There remains no substitute for experiencing a building first hand.

Any attempt to encompass thousands of years of history in a single volume naturally involves an act of selection. In the end, I have chosen libraries that I thought were particularly pertinent to the story and have arranged the book broadly chronologically, although I dip out to explore particular themes. In all cases I have been heavily reliant on the work of other scholars and existing scholarship. These sources are listed in the references and bibliographical essay at the end of this book. I hope that the result will provide an entertaining introduction not just for those interested in the history of libraries and the development of architecture, but also for all those who love books and the beautiful spaces designed to house them.

James W. P. Campbell

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Introduction

Libraries can be much more than simply places to store books. Throughout the ages, the designs of the greatest library buildings have celebrated the act of reading and the importance of learning. They have become emblems of culture, whether it be for an individual, an institution, or even a whole nation. This book tells for the first time the complete story of the development of library buildings from the first libraries, in ancient Mesopotamia, through the lost libraries of the classical civilizations, the monastic libraries of the Middle Ages and the lavish libraries of the Rococo, to the monumental libraries of the modern world. It shows how the development of library buildings illustrates the changing relationship of mankind with the written word and that across the world libraries have always been not just dusty repositories for documents but active symbols of culture and civilization.

The word 'library' in English and most other European languages is ambiguous: it can refer either to a collection of books or to the space that houses them. This lack of distinction between the two is interesting, but it is far from universal. In Chinese, and many other languages, the words for collections of books and the spaces that contain them are not the same. In Chinese, a library space is called 'a building for books'. Indeed, the present work might be justifiably called a 'history of buildings for books'. Despite these linguistic differences, libraries across the world developed in strikingly similar ways.

Any historical survey must necessarily be selective. A recent government census suggested that there are 2,925 public libraries in China alone.¹ A majority do not have buildings of their own. Like most of the public libraries in the late-19th-century United States, they will be housed in parts of existing buildings that have been adapted for the purpose.² Such rooms are rarely architecturally interesting. A great many owners of libraries and institutions have taken only the slightest interest in the way that their collections are housed. However, in every period others have wished to display their books. They have taken pride in their shelving and have been eager to show their books off to the best advantage. They have wanted not only to own books, but also to create a beautiful library to put them in. The history of the library as a piece of architecture – the one that this book seeks to tell – is the history of those libraries: that is, libraries that are designed to be seen.

Survival and alteration

The problems of interpreting ruins are obvious, but even where libraries have survived, they rarely

remain completely unchanged. Many have been subject to quite radical alterations over time. Few libraries demonstrate this better than the Long Room at Trinity College, Dublin. The arrangement of this impressive early-18th-century library, which combines a barrel vault with two storeys of alcoves, appears to be the first of its kind. However, it is not what it seems. The building, which was designed by Thomas Burgh (1670–1730), the Surveyor General of Ireland, and completed in 1732, was undoubtedly an important library when it was first built, but it looked very different from the room we admire today.³ Its tripartite design consisted of two three-storey pavilions flanking a colonnade on the ground-floor level and the two-storey-high Long Room above. One of the pavilions contained the staircase leading to the library and offices for the librarian, and the other provided room for a philosophy school on the ground floor and a manuscripts room above. The ceiling of the Long Room was originally lower and flat and the upper galleries did not support bookcases. The distinctive barrel vault was only introduced by the architects Deane and Woodward in 1856, when the original library underwent a radical remodelling, which included raising the roof and filling in the ground floor.⁴ Thus the library we see today is essentially a 19th-century creation. Here, as elsewhere, distinguishing later additions from the original is a considerable challenge. This brings us to another important issue in the history of libraries: who designs them?

Who designs libraries?

The intentions of the designers of libraries are often very difficult to determine. Libraries are never entirely

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left
SUTRA REPOSITORY,
WAT YAI, date unknown
Samut Songkhram, Thailand

Thai sutra repositories, containing the Buddhist scriptures, are typically placed on stilts in ponds to protect both the buildings and their contents from ants and termites.

work of individuals. Patrons are involved from outset. Thus the layout of the library of Merton College, Oxford, seems to have been determined by Henry Savile, a close friend of Thomas Bodley, founder of the Bodleian Library (see pp. 113–14). Savile had any formal training in design. Patrons are not always individuals. Libraries have from the beginning been funded by corporate bodies, governments or civic authorities. In such cases, the committees involved may be happy to devolve the decision-making to design teams or other groups of individuals. An architect or patron may indeed be a guiding figure, but often is just one voice among many. Patrons, architects, cabinet-makers, painters, sculptors, librarians, scholars – all may have a direct influence on the final form. In some cases, architects might design nothing more than the shell. In others, they might exercise complete control, obsessively orchestrating an extraordinarily elaborate, complete work of art. In modern times, librarians are frequently involved in the design of libraries, yet this has not always been the case. In the past, a librarian was often not appointed until the library was finished. The changing power of the librarian in library design is an important theme in this book.

Iconography and social meaning in libraries
 Libraries are always built with a particular socio-political intent. They indicate to the wider world the scholarly ambitions of individuals or organizations. And, in the case of public libraries, they can also be a charitable, civic gesture. In the simplest cases, the mere existence of the library may represent the

complete extent of this message. Usually a more explicit message is implied. Thus the Lenin State Library in Moscow was built not just as an important resource but also as a symbol of the intellectual pretensions of the fledgling Communist state, in which the readers were watched over by brooding statues of their leaders. The most complex Rococo libraries, such as those at Altenburg Abbey in Austria and Wiblingen Abbey in Germany, had intricate iconographies, integrating sculptural and pictorial decoration to communicate to the reader a particular intellectual attitude to knowledge and its place in civilized society or a particular institution. The interpretation of such messages is relatively simple and straightforward if the patrons or designers have been kind enough to leave behind a written statement of their intentions. Unfortunately, this is rarely the case. In the absence of any documentary evidence, it is necessary to study those libraries for which written sources do exist and then draw parallels with those where they do not. It is important to guard against over-interpretation and the imposition of over-elaborate or anachronistic reasons for elements that may have been shaped simply by practical considerations or the desire to copy a well-worn formula or established device.

The form of books and their effect on library design

The history of libraries is in part the history of the book. For the purposes of the present study, ‘book’ refers to anything that can be written on and that is intended to be kept for later reference. The current form of the book is neither universal, nor particularly old. Early books took the form of clay tablets, scrolls, palm leaves, carved stones and rolls of silk, all of which were stored in libraries of one sort or another. The modern book – or codex, to use its proper name – is a relatively recent invention.

The method of manufacture of books is important as it affects their form and their cost, as does the material from which they are made. The copying of books by hand is a slow, laborious process. Printing enabled books to be produced more quickly and sold more cheaply. Printing in China, Korea and Japan developed in a different way from that in the West. In those countries, there were no printing presses

opposite
THE TRIPITAKA
KOREANA, 1251
Haeinsa, South Korea

The timber printing blocks of the Tripitaka Koreana, a complete set of the Buddhist scriptures, fill the shelves of one of the oldest intact libraries in the world.



left
18th-century books,
ABBEY OF ST FLORIAN
LIBRARY, Austria

Old manuscripts have been reused as endpapers in the bindings of these books, a common practice.

involved. Instead, woodblock plates were covered in ink and the paper or cloth was placed over them and rubbed down by hand or with a brush. This was made possible by the use of very soft, very thin paper. In texture it was akin to silk and indeed may have been made to imitate it.

In Europe, the printed codex mimicked its manuscript forebear. It was made from thick paper or parchment, which, as it was opaque, could be printed on both sides. Groups of pages were folded into what are called quires. These quires were then stitched together to form a single volume. The thick paper needed to be pressed onto the printing block using a mechanical press. This use of thick paper with writing on both sides, bound using quires, resulted in the type of book familiar to us today.

Scrolls (folded like concertinas, or rolled like Greek and Roman scrolls) were used in China, Korea and Japan from the Spring and Autumn period (770–481 BC) to the Tang dynasty (AD 618–906), but they were primarily reserved for documents written by hand. As printing in China involved impressing the pages onto separate, flat printing-block-sized sheets, from the beginning it involved making a form of codex rather than a scroll.⁵ Typically a woodblock was used to print two pages. The page was designed for the two inked sides to be folded to face each other. The transparency of the thin paper made printing on the reverse difficult, so it was rarely done. The folded sheets were then simply stacked. When the book

was complete, single-sheet covers of coarse paper were placed on the top and bottom of the pile of folded pages, which were then bound into a volume by threading string through the whole stack (which was not in individual quires as in the West). Separate volumes making up a single work were put into a box or wrapped in paper or in a cloth-bound board cover to keep them together. The result, with its thin sheets of paper, simple, exposed string bindings and covers was, and still is, quite unlike a Western codex.⁶

Terms used for describing libraries

One element that sets libraries apart from most other architectural spaces is the primary importance of their furniture and fittings. It is possible to discuss the architecture of a church or castle that has lost its original furnishings, but very difficult to discuss a library that has had its fittings removed. The physical form of a book is important because it determines its method of storage. This might be in a chest, in a pigeon-hole, on a rack, in a cupboard or on a shelf. The history of the library is partly the history of the relationship between the changing format of the book and its method of shelving. And just as shelving has changed throughout the ages, so the book itself has been adapted to make it easier to shelve.

Various terms are used for types of book storage. Books may be kept in chests, in cupboards or on shelves. The term 'book chest' is self-explanatory. Freestanding book cupboards are often called by

OF ST PETER
ALBURGA, 1555
Netherlands

Library has
remained
largely unchanged
in structure,
clear idea of
what a lectern
system Europe
The books are
on lecterns.

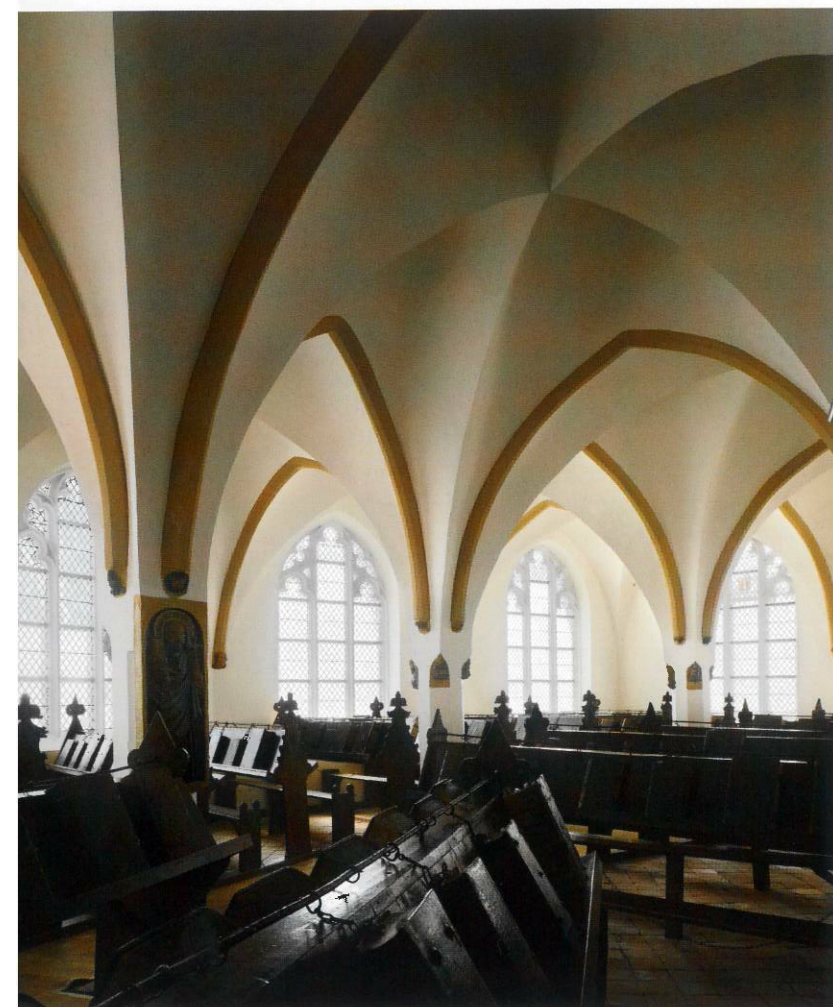
the Latin term *armaria* or by the word 'press', from which we get the term 'pressmark', a notation on a book indicating where it should be placed in a library. Of course, all such cupboards contained shelves, but they were not visible. Glass-fronted bookcases did not appear until the 17th century. Early libraries have either cupboards or open shelves. Later ones often combine the two, placing cupboards under shelves.

Bookshelves in libraries are usually fittings, that is, they are built-in or permanently attached to the walls. Ways of describing the various shelving arrangements used in libraries throughout the ages are awkward and vary in different languages. This book follows other English writers on the history of library design by using the terms coined by J. W. Clark in *The Care of Books* (1901). Medieval libraries

generally placed books on reading desks, often with integral benches, in rows at right angles to the walls. Clark called this 'the lectern system'.⁷ A beautiful example of this arrangement survives in Zutphen in the Netherlands (see pp. 88–9). As we shall see, the lectern system had important variants. After the invention of printing, lecterns could no longer cope with the increase in the number of books. One solution was to replace them with full-height bookcases, dividing the room into separate bays. Clark called this the 'stall system', although it should perhaps be more correctly termed the 'Oxford system', because that is the place where it was invented and where it was most common.⁸ Although it has been much copied, as we shall see, it is not an ideal solution. It is a fascinating example of how a certain arrangement has become so associated with library design that it is still used despite its drawbacks.

The alternative to the lectern or stall systems was lining the walls of libraries with the built-in shelves, which Clark called the 'wall system'.⁹ There is an intermediate stage, which Clark did not discuss, in which open bookcases are placed against the walls but not made integral with them, from which the true wall system developed. The most famous example of this type is the library of the Escorial in Spain. Wall-system libraries could be in rooms of one, two or even three storeys or tiers, the upper levels being accessed by galleries. In the late 17th century a new form of library arrangement appeared that combined the characteristics of the wall and stall systems with cases both against and at right angles to the walls. This book uses the term 'alcove' (see Chapter Four) to describe this arrangement, which is the normal description, although it is not one used by Clark.

As books became more numerous, other ways to store them had to be invented. Mass storage led to the development of the stack, a series of spaces specifically designed to maximize the number of books stored in the least possible volume. Bookstacks were at first fixed, but later examples were designed to move on rollers placed in the floor or suspended from the ceiling. Stack shelving greatly increased capacity, but was rarely a subject of architectural celebration, usually being confined to publicly inaccessible and windowless stack rooms, which were designed to



below, right and opposite
TRINITY COLLEGE LIBRARY, 1856
Dublin, Ireland

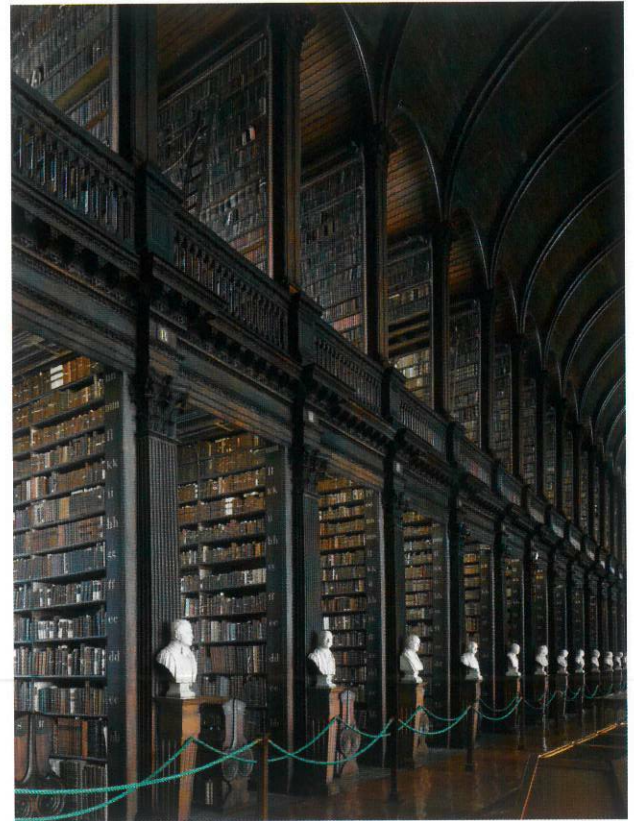
Designed by Thomas Burgh and completed in 1732, this is rightly considered one of the most famous libraries in the world, but all is not as it seems. An engraving (below) shows the library as originally built, with a flat ceiling and no books on the galleries. The library as it appears today (opposite and right) is not a reflection of 18th-century thinking but the result of a major reconstruction by the architects Deane and Woodward completed in 1856.



have the perfect conditions for book storage rather than to suit the needs of human beings.

Books have not always been placed on the shelves vertically. This is a comparatively recent innovation. It was developed because it enabled a large number of books to be stored in a relatively small space, but it is far from universal and really only suitable for books that are designed to be shelved in that way. In many cultures, books are simply stacked horizontally on top of each other on the shelf. This arrangement has its drawbacks: taking a book from the bottom of a pile involves moving those on top. The vertical spacing of shelves in a bookcase in which books are stacked in this way is relatively unimportant as long as the shelves are far enough apart to accommodate a few volumes. Shelves in such libraries are thus invariably fixed, and the regular spacing of the shelves is pleasing to the eye.

Once books were placed upright, the spacing of the shelves became important if the number of volumes that could be accommodated was to be maximized. The books had to be sorted by size and the shelves were arranged accordingly. Large books were typically placed on the lower shelves while smaller ones – which were easier to steal – were placed at the top, out of reach. Designers of libraries were reluctant to abandon fixed shelves and examples such as the library at Mafra Palace in Portugal and the Duchess Anna Amalia Library in Weimar, Germany, show that libraries were still using them in the late 18th century. But gradually it



became clear that it was more efficient if the shelves could be adjusted, so various systems were invented in the 18th century to allow this to be done. Initially these relied on timber notches or slots cut into the vertical supports, but in the late 19th century they were gradually replaced by proprietary systems using metal fixings. The shelves on which the books were placed were at first always timber. Metal shelving did not appear until the 19th century. Its strength and resistance to fire were obvious advantages. But there were always concerns about placing expensive leather bindings on hard metal surfaces. Owners of particularly valuable collections preferred timber shelves and often spend large sums lining them with leather or cloth coverings.

Stairs, ladders and stools

The design of the shelving also presents another problem: access to the shelves. Ideally, no library shelving system would place the books out of reach of those trying to retrieve them. If this dictum had been followed religiously then no library would have had shelves more than 2 m (6 ft 6 in.) above the floor. However, throughout the ages library designers have broken this rule continuously. The history of library design is partly an exploration of why they have chosen to do so, and partly a history of the ways that designers have then dealt with the problems that they have created.

In simple libraries, reaching high shelves might require nothing more than standing on a bench

ACE LIBRARY, 1771
gal

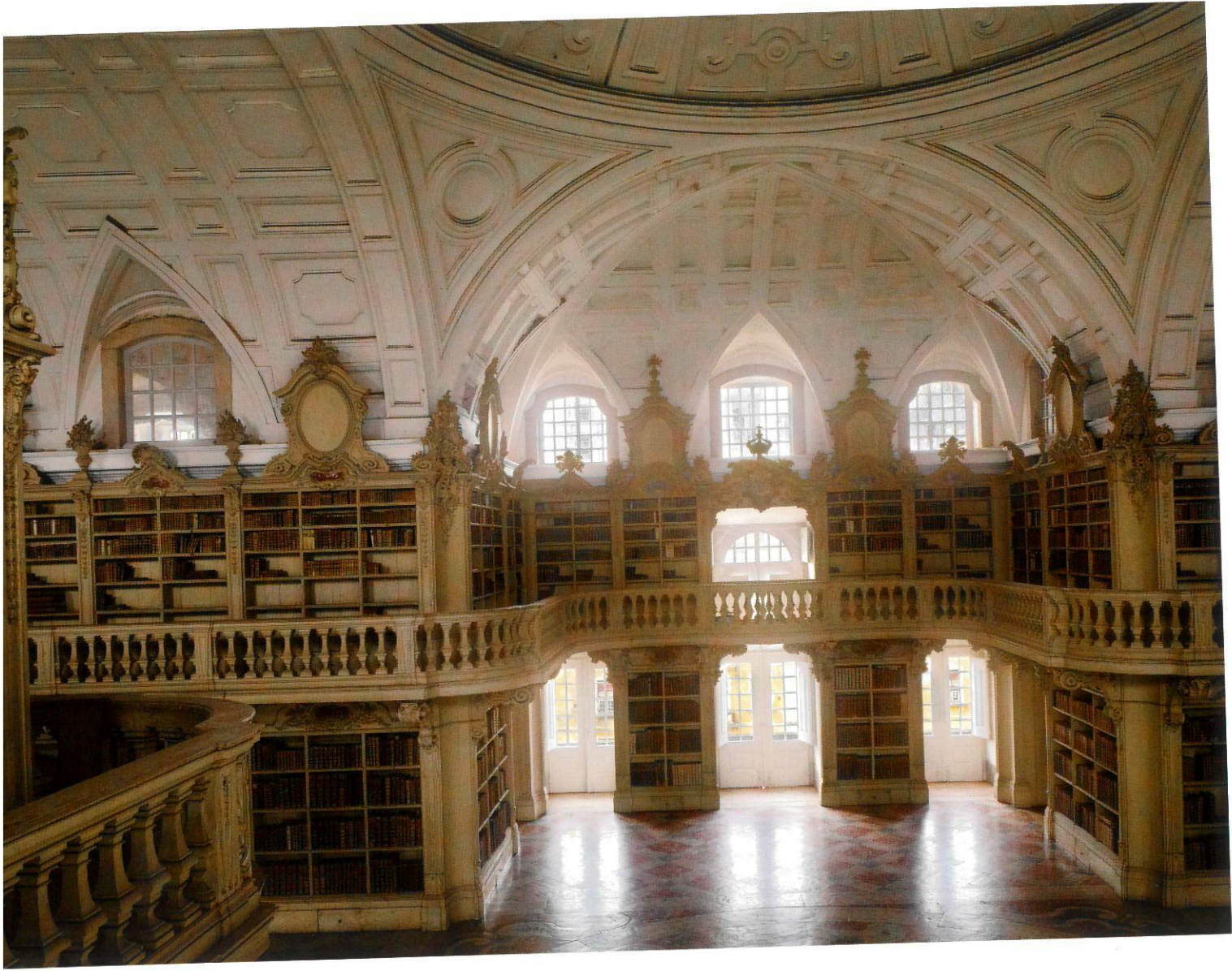
of the palace in Mafra was started in 1717, but the
it completed until 1771. By then the original plans for
l interior had been abandoned. Since its opening the
en home to a colony of tiny bats, which feed on the
ight otherwise damage the books.

For the Wren Library at Trinity College,
, for instance, Christopher Wren (1632–1723)
tools that have specially splayed legs to
a more stable when they are being used in
onger reaches require a ladder of some sort.
e are fixed to the shelving in some way to
likelihood of accidents. In the Biblioteca
Coimbra, Portugal, ladders slide out of
ly designed pockets in the uprights between
ases.
all spaces will incorporate one or more
ccessed by staircases. In some libraries the

staircases are hidden within the walls; in others
they are exposed and even celebrated. In Baroque
and Rococo libraries they frequently give rise to
elaborate methods of concealment, incorporating
secret doors and moving panels. Readers may thus
be able to see the books that they want but be
completely unaware of how to reach them. At
Wiblingen Abbey, for instance, the doors opening
into the gallery are disguised as niches containing
statues. The theatricality of this arrangement was
typical of the Baroque and Rococo, which enjoyed
architectural surprises and conceits.

opposite
DUCHESS ANNA AMALIA
LIBRARY, 1766
Weimar, Germany

The library is named after
Duchess Anna Amalia of
Saxe-Weimar-Eisenach, who
expanded the ducal library
and arranged for it to be
moved into the present Rococo
building. It is an oval room
set within a rectangle. The
left-over spaces form a passage
around the oval, and open
shelves provide glimpses
between the two. Johann
Wolfgang von Goethe was
later appointed its librarian.
On 4 September 2004 an
electrical fault caused a fire
that destroyed over 50,000
volumes and completely gutted
the library. It has since been
painstakingly reconstructed.



ENBURG ABBEY
iARY, 1742
burg, Austria

*Rococo library was
ned by Josef Muggenast
liberately exaggerate the
rtance of the collection.
ite its enormous size, the
contains relatively few
s.*



**WIBLINGEN ABBEY
LIBRARY, 1744
Wiblingen, Germany**

Constructed between 1737 and 1740 and decorated in 1744, this magnificent Rococo library spans the complete width of one wing of the monastery.

gement of the books
ement of shelving is designed not only
the books, but also to make them
find. Once volumes are placed on a
atural to sort them. From the beginning,
ve had written catalogues. Much has
n on how libraries in the past were
help guide the reader to particular subjects
ings or sculpture. In particular, André
00–1986), a former French government
f libraries and leading library historian,
dea of a pictorial catalogue.¹⁰ However, as
nself was forced to admit, this relationship
straightforward. Even Rococo libraries,
se at Wiblingen Abbey and Altenburg
lettered and numbered shelves and relied
catalogues to find the books.
st written catalogues were simple inventories
lists and could be written effectively on clay
few sheets of parchment. But as libraries
o did the size of catalogues. Callimachus's
atalogue of Greek writing compiled in the
BC, mostly from the library of Alexandria,
ve filled 120 scrolls.¹¹ The inventory of the
y Islamic library in Cordoba, Spain, filled
twenty-page booklets.¹² In neither case do
here the catalogue was placed within the
libraries became very large, the physical
catalogue and its placement became a key
rary design, until physical catalogues were
entirely by computers.

g books from harm
ave always been designed not only to
rs find the volumes they want, but also to
eir collections from the great enemies of
ely dust, damp, mould, insects, vermin,
res. Of these, fire is by far the most
g. Deliberate and accidental fires have
nturies deprived us of many of the world's
lections and the buildings that housed
e Palatine library in ancient Rome was
n a fire in AD 80. Libraries today can still
ble: in 2004 the beautiful Rococo Duchess
lia Library in Weimar suffered an electrical
evastating consequences.



Fear of fire has had an effect on library design throughout the ages. Most libraries banned the use of candles for lighting, which limited their hours of operation and meant that large windows had to be provided to give adequate light for reading. Libraries were often built in brick or stone and given masonry vaults in the hope of resisting the spread of fire from other buildings. As heating in early buildings was

QUE SAINTE-GENEVIÈVE, 1850

enri Labrouste, the library has a famous iron roof
illeries reached by iron staircases in the corners.
e the readers from the bookcases, which, like the
ccessible only to the librarians, who fetch all the
ces underneath the galleries form passages lit by
s in the front façade and lined internally with
ide additional book storage.

IN STATE
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unded in 1862 as
v Library, was
I. Lenin State
USSR in 1922.
s present name
rrent building,
145, was
adimir Shchuko
Gelfreikh in a
al style. Readers
atchful gaze
e of Comrade

generally from open fires, many libraries were left
unheated. Later, elaborate systems for circulating
hot air were developed.

Vermin are more difficult to prevent by means
of design. Mice like nothing better than making
their nests out of paper. Many readers assume that
eating and drinking are banned in libraries to avoid
damaging the books. This is part of the reason, but
the main concern has always been to avoid
encouraging mice, rats and insects. Unfortunately,
the voids behind bookcases, designed to separate
the timber holding the books from the damp masonry
walls behind, make ideal spaces for mice to live in.

Insects can devastate collections. Although there
is no such thing as a 'book worm' that lives on nothing

else, a variety of insects will eat books because of the
similarity of paper to dry wood. Others are attracted
to the starch and glue in the bindings. Some of the
commonest pests are the larvae of the common
furniture beetle (*Anobium punctatum*) and silverfish
(the genus *Lepisma*). In tropical countries termites
are a major problem and both furniture beetles and
termites will eat the shelves as well as the books.¹⁴
Sealing books in cabinets does not necessarily
protect them. Temperature and humidity are factors
in the prevalence of insects and warm cupboards
may provide perfect breeding grounds. In modern
libraries air-conditioning and sealing the building
are the usual solutions. Historically, all sorts of
methods have been attempted to eliminate insects.



NAL LIBRARY
IA, 1941
venia

že Plečnik,
rs a deliberate
e Modernist
ament. This
arble staircase
lically from
f the outside
the light of the
and is framed
urble columns
vilization.

In the Tianyi Chamber in China in the 16th century bags of insect-repelling herbs were placed in the cupboards. The 18th-century libraries in Coimbra and Mafra used (and still use) colonies of bats. They roost behind the bookcases in winter and outside in summer, emerging at night to feed on the insects that live on the books. As the bats in question are tiny, barely 25 mm (1 in.) long, they can squeeze through gaps in the window frames and cause no damage to the books themselves. The only downside is that they leave droppings on the floor of the library that need to be cleared up every morning.

Damp, and the mould that results from it, has always been a big problem in libraries. In tropical climates mould destroyed libraries quicker than elsewhere, but only in desert climates could it be entirely avoided. Damp Alexandria was one of the worst places in Egypt to choose as the site for a great library. Shelves are designed to prevent damp from the walls transmitting to the books. In some libraries the backs of the cases are filled with desiccating or absorbent materials. In China, gypsum was placed beneath cases to try to reduce damp. In all cases, books are placed so the air can circulate freely and humidity levels can be carefully monitored.

Lastly, there is the problem of book theft. Book collections are often extremely valuable, and in all periods library designers have been keen to deter thieves. In older libraries physical measures were taken to stop visitors and readers from stealing the books, including fitting doors with stout locks and chaining books to the shelves. Newer ones employ sophisticated electronic surveillance systems to do the same. In many periods the prevention of theft has been a major factor in determining a library's form and location.

Building construction

Various factors have helped to favour certain forms of construction for library buildings over others. For instance, the fear of fire has always been a strong determinant in the choice of materials, resulting in brick and stone vaults in Rococo libraries and iron frames in 19th-century ones. Strength of materials and structural form also determine the limits of what can be achieved. Shelves of books are heavy, presenting a not inconsiderable structural problem in their own

below
BIBLIOTHÈQUE NATIONALE, 1996
Paris, France

The library, designed by Dominique Perrault, occupies a prominent location beside the Seine. It forms a raised urban square with four towers marking the corners of the site. The lower floors of the towers contain office space, and the upper floors are used to store books.

right. When the library at Trinity College, Cambridge, was constructed in the late 17th century, the weight of books it contained was so great that Wren had to design a special timber truss to support the cases.¹⁵ In the 19th century, the use of iron solved many of the structural problems. The iron structure of the Peabody Library in Baltimore, MD, in the United States, easily supported six storeys of books and allowed it to be built over the top of a concert hall.

Books are only part of the problem. The main spaces of libraries, the reading rooms, often present considerable structural challenges. Their width is limited by the ability to construct a roof or ceiling that can cover them. If that roof is to be fireproof

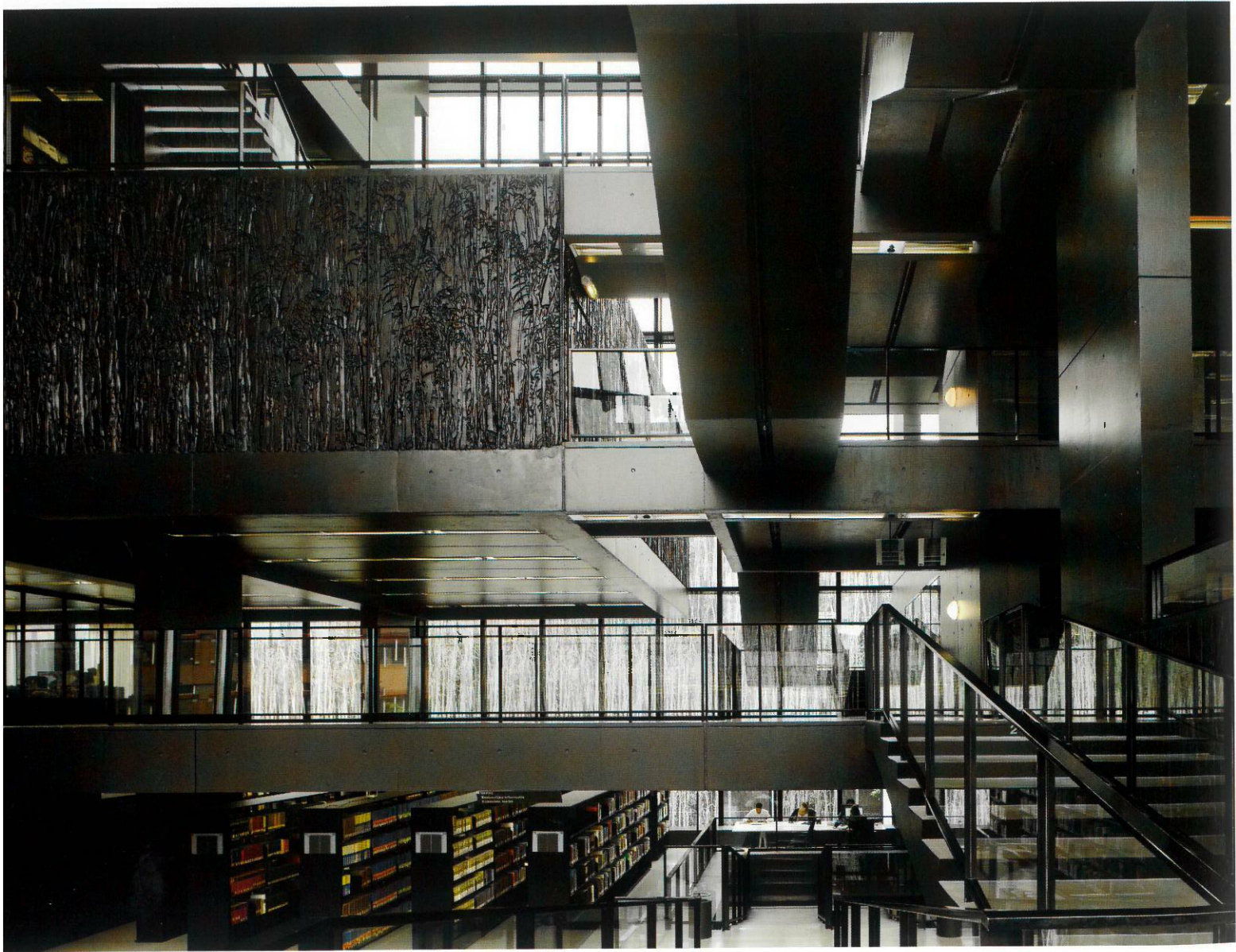


ECHT UNIVERSITY LIBRARY, 2004
ht, Netherlands

ned by the Dutch architect Wiel Arets, the main reading room
des study facilities in a large space, spread over many levels
d by stairs and galleries. There are rooms for group working,
open spaces with long rows of desks, and smaller, more
ate spaces between the bookcases in the open stacks. The
books rooms and other specialist reading areas are contained
eries of sealed boxes above. The whole library is painted
; with white floors.

there are additional problems to be addressed.
s the brick vaults of many early libraries required
s of columns to support them. In the 16th century,
n the architect Jacopo Sansovino (1486–1570)
tried to design a free-spanning vault for the
ioteca Marciana in Venice without intermediate
mns, it collapsed, delaying the works and causing
siderable embarrassment.
Stacks pack very large numbers of books into
ll spaces and thus create very large loads, which
rn determine their position and construction.

The early examples tended to be on the ground floor
as a result. The main reading room in the New York
Public Library is placed above the stacks because
the reverse arrangement would be very difficult to
achieve structurally. Readers have to climb to the top
of the building, however, a situation that could have
been avoided had the reading room been on
the ground floor. Similarly, the wish to have brick
vaults over libraries in the Rococo period placed
constraints on the size and shape of the spaces that
could be created.



TAMA ART UNIVERSITY LIBRARY, 2007
Tokyo, Japan

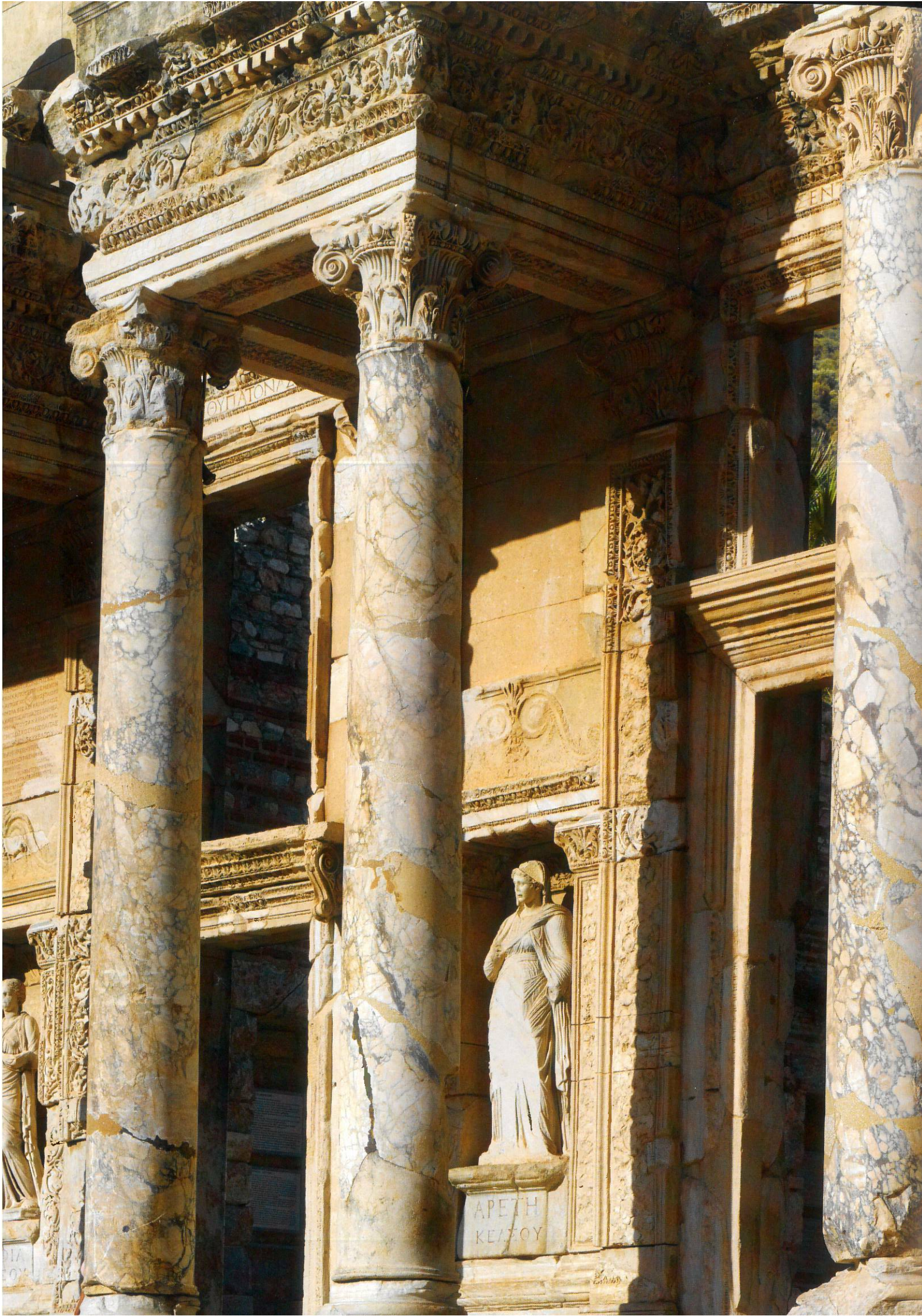
The library, designed by Toyo Ito, consists of steel-plate arches embedded in concrete. The ground floor slopes, following the terrain. The building is typical of a spirit of experimentation in Japan that has produced some of the strangest and most imaginative library buildings over the past fifty years. The curving floor plate and arched windows challenge the rectilinear geometry of the bookcases, and thus our expectations of what a library should look like.



Tracing the changing form of the library

The factors discussed in this introduction – structure, heating, lighting, the form of the book, the iconography of the building, and the necessity of protecting books from harm – have affected the shape of libraries in all parts of the world in all historical periods to varying degrees. It is tempting to assume that this is a straightforward linear evolution, but, as this book seeks to show, this has never been the case. The library is a constantly changing idea. Forms have continually appeared and disappeared throughout history, yet at every point there are recurring themes.

Architects and librarians embarking on a new building project have often started by touring existing great libraries. The architect Gunnar Asplund (1885–1940), for instance, travelled to England, Germany and the United States before he prepared the designs for his Stockholm City Library. Similarly, Wiel Arets (1955–) has written about the lessons he learned from visiting Dominique Perrault's Bibliothèque Nationale in Paris and Hans Scharoun's Berlin Staatsbibliothek before he began designing the Utrecht University library. A knowledge of why things were built in a certain way is the first step in understanding how, or why, we might want to do it differently in the future.



Lost Beginnings

Libraries in the Ancient World

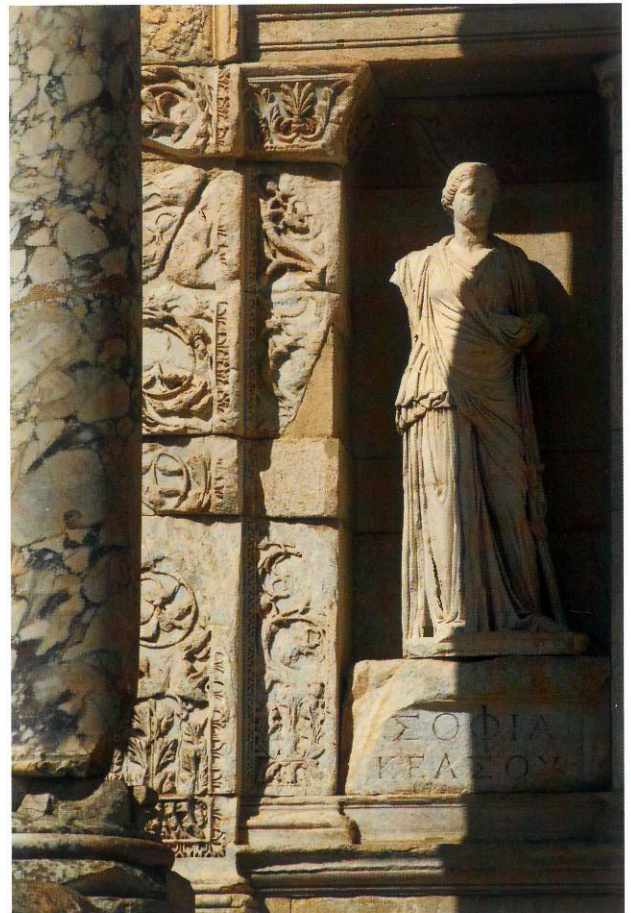
Books are written by the living for the living, but as time passes a library inevitably becomes the repository of the thoughts and conversations of the dead talking to the dead. If the books themselves disintegrate, or are destroyed, those thoughts and memories, and our sense of the culture that held them, are lost to history. Thus we know a great deal about some cultures, but others that did not write, or that chose to write on perishable materials, are invisible to posterity. Our knowledge of ancient cultures is essentially a story of loss.

This chapter traces the story of libraries from the beginning of writing to the fall of the Roman Empire. This period, from around 3400 BC to AD 600, some 4,000 years, was instrumental in forming the institutions that characterize Western civilization. Most of the types of libraries that exist today have their roots in the ancient world: the idea of the encyclopaedic library (which aimed to collect all the books in the world); the academic library; the administrative archive; the private library; and the public library all began in the Middle East. The legends that grew up around these prototypes were highly influential on the form and organization of their later equivalents, and the myths that surround them continue to inspire architects today.

Mesopotamia

The first writing system was developed 5,500 years ago in Uruk in ancient Mesopotamia for keeping simple records of financial transactions. The exact date of its invention is uncertain but it is generally accepted that it appeared sometime between 3400 and 3000 BC.¹ Writing developed to answer a particular cultural need. The civilizations that grew up in ancient Mesopotamia coalesced around a mythical system in which it was understood that the gods had chosen the king and the priesthood to own all the land. Their subjects were allowed to farm it on their behalf in return for payments of food. Writing was invented to keep track of these payments, and the earliest surviving written documents were lists on clay tablets recording who had paid what, to whom and when. This information was kept to make sure that everyone had paid their dues, and from the very beginning such records needed to be stored for reference. The records were kept for generations in an orderly fashion until eventually, like all files, they became irrelevant and were discarded.

These archives are the very earliest form of library, although purists would claim that as they were used to store files, not books, they should not be termed libraries at all.² In most sites where clay tablets have been found in excavations, they are no longer in their original context. They are found in the remains of ancient rubbish dumps, or where the tablets have been reused as building materials, leaving no clue to their original location. Thankfully, this is not always





LIBRARY OF CELSUS
AD 135. Ephesus, Turkey

The building acted as both a library and a mausoleum. Celsus is buried in a stone sarcophagus in a low vault below the central niche in the library. Much of the decoration alludes to the myth of his death. Thus the eagles flying out of garlands are believed to be a reference to his son's name (Aquila means eagle) and the eagle on whose wings a person is borne to heaven.

the case.⁵ In 1975 archaeologists excavating the palace of the ancient city of Ebla, in Syria, near modern-day Aleppo, were lucky enough to uncover an archive room containing small fragments and larger parts of 15,000 original tablets that had still been on their shelves when invaders set fire to the palace in 2500–2250 BC. The tablets were found scattered on the floor of the room where they had fallen when the wooden shelves supporting them collapsed. They were still more or less in the order in which they had been placed on the shelves some 4,000 years before.⁴

The library at Ebla

The library at Ebla is unlikely to have been the oldest library in the world, but it is certainly the best-preserved early example discovered so far and it provides invaluable information about the physical appearance of Mesopotamian libraries. What is immediately noticeable is that it was a very modest room. Rectangular and measuring just 3.5 x 4 m (approximately 11 ft 6 in. x 13 ft), it was little more than a storeroom, lined with bookshelves on all sides. Other excavations have shown similar rooms elsewhere in Mesopotamia and Ebla appears to have been typical. One side and the upper parts of its walls and ceiling were destroyed in the fire, so we cannot be exactly certain of its size or shape but it cannot have been a large room and probably had no windows. Adjacent to this room was another, which had benches around the sides. It contained a jar with writing implements and is thus presumed to have been

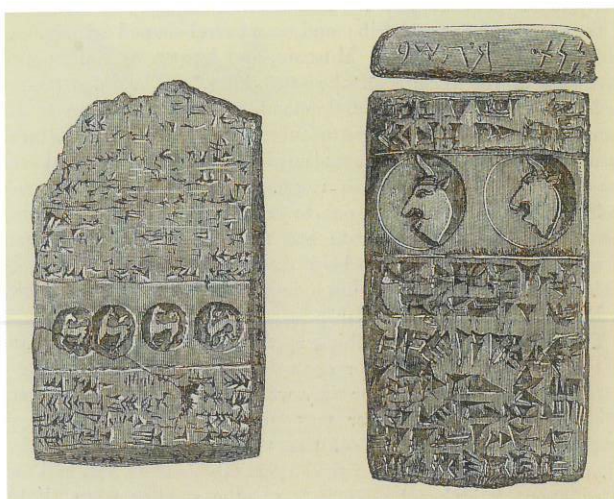
a room where scribes worked. Thus at this very early date we first see the common later arrangement of the separation of spaces for storage and for reading and writing.⁵ The tablets found at Ebla are a mixture of archival records and pieces of a more literary nature, including bilingual texts, incantations and the written version of a Sumerian myth. The non-archival texts seem to have been stored on a top shelf in the north wall. They were presumably a few reference works used by the scribes working in the adjacent room.⁶

Shelving clay tablets

The Ebla library is particularly important for the insights it gives into the shelving of books in this period. The books in question were, of course, clay tablets. The Ebla examples were quite large, measuring 210 x 210 mm (a little over 8 in. square) and 20–30 mm thick (a little under to a little over 1 in.). Clay tablets were cheap and easy to make. The size of tablet used throughout the Middle East varied. The smallest were tiny (just 2 cm – 0.8 in. – square and a few millimetres thick) while the largest could be 30–40 cm (12–15 in.) square and 4–8 cm (appx. 1½–3 in.) thick.⁷ Most tablets are surprisingly small and fitted easily in the palm of a hand. They would be partly dried in the sun and then marked, while still soft, using a wooden stylus with a flat end. The simplest marks to make with such a device are small wedges, which leads to the term ‘cuneiform’ (from *cuneus*, Latin for ‘wedge’). Once complete, they would be laid out in the hot Mesopotamian sun to bake hard. In

TABLETS FROM
THE LIBRARY OF
ASHURBANIPAL, c. 650 BC

from Henry Layard's account of his excavations, published in 1849. One of the large tablets that Layard and Hormuzd Rassam found in the ruins of Ashurbanipal's palace was sent to the British



certain cases they might be fired in a kiln, creating a more permanent record.⁸ Many of the tablets that have been recovered, including those from Ebla, have been accidentally burned in fires, which is how they came to be preserved. Indeed, Mesopotamian libraries are the only ones in history for which fires, far from being detrimental, were the principal cause of their survival.

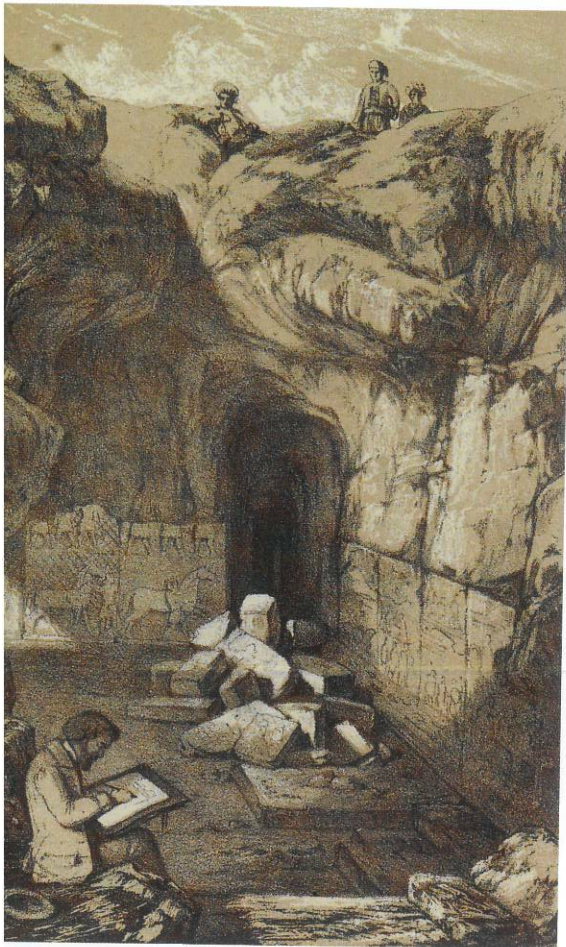
The tablets at Ebla were placed on wooden shelves that extended down to the ground. They were not arranged like modern books with the spine outwards, but in rows like index cards, the marked front face towards the reader, with other tablets behind. The shelves were widely spaced (double the height of the tablet) so that the reader could reach in and tip the tablets forward in order to see the tops of the ones behind.⁹ In other excavated library buildings there were masonry benches around the walls. Some had masonry pigeonholes into which the tablets were slotted. Others featured clay boxes in which the tablets were stored vertically and examined like index cards. Similar boxes of wood, leather or woven materials were used for transport. Many collections had small clay docketts attached by string to the upper edge of each tablet giving the tablet number, the coffer or basket number and a note of what the tablet contained.¹⁰ Others, as at Ebla, had a colophon on the upper or outer edge. The reader could thus read the docketts or scan the edges of the tablets to find the one required. As tablets could contain only a limited amount of text, longer pieces of writing took up many tablets. Tablets were not the

only form of writing material: we know from library catalogues that boards covered in wax were popular, but none of these survive. A very large number of tablets have now been recovered from a considerable number of Mesopotamian sites. Clay tablets, correctly stored, and kept away from damp, can last for many hundreds of years and in the case of those that have been fired (accidentally or deliberately), for tens of thousands. Clay, however, is unwieldy compared to other writing materials. The reason for its use was simple expediency: it was the only material readily to hand in ancient Mesopotamia.

The earliest cuneiform writing consisted only of numbers and nouns, but it was not long before the system was adapted to incorporate the ability to translate any word into writing. As the writing system was phonetic, it could be used to transcribe languages other than ancient Sumerian. As a result, cuneiform was a remarkably resilient form of writing and was used to write Akkadian, Eblaite, Elamite, Hittite, Hattic, Hurrian, Luwian and Urartian, ensuring its survival for over 3,500 years, long after clay tablets had ceased to be used.¹¹ The vast majority of clay tablets found in archaeological excavations in the Middle East are archival and consist of lists of items. From around 2500 BC other forms of writing begin to appear. Sometimes these are textbooks for teaching writing, but in the Sumerian city of Nippur lists of gods, professions, hymns and writing exercises have been found, suggesting that they belonged to a school of scribes or a temple and formed some sort of early library.¹² The best-known and most extensive library of the period was that of the Assyrian king Ashurbanipal at Nineveh, dating from 668–630 BC.

The library of Ashurbanipal

Tablets from Ashurbanipal's library were discovered almost by accident by the amateur archaeologist and adventurer Henry Layard (1817–1894) in 1849. Others were subsequently excavated by his associate Hormuzd Rassam (1826–1910) and many ended up in the British Museum.¹³ Ashurbanipal's library was remarkable because it represents the first documented attempt to collect all knowledge systematically, predating the much better-known library of Alexandria (see pp. 44–7) by three hundred years. Ashurbanipal went about the



EXCAVATING THE LIBRARY OF ASHURBANIPAL Nineveh, Iraq

This illustration from Henry Layard's book clearly shows how the remains looked when they were discovered in 1849. Layard described the floor as being covered with whole and broken tablets, most of which had already been removed when this drawing was made.

Ancient Egypt

The use of clay tablets in the Middle East ensured the survival of the texts inscribed on them. Those cultures that chose to write on more fragile materials have left fewer traces behind them for archaeologists to find. The Egyptians, for instance, had a writing system at least as early as 3000 BC and inscriptions survive. Unfortunately, however, their chosen medium for books and records was papyrus. Indeed, for over 3,000 years papyrus was the chosen writing material not just of ancient Egypt, but of the whole Mediterranean.¹⁷ The Egyptians enjoyed a monopoly on its production. Their rulers later exported it to the Greeks and Romans, limiting supply to keep the price high.¹⁸ As a writing material papyrus was not perfect. Its roughness affected the marks that could be made and its flexibility was limited: if the leaves were fixed at the edges to form books they tended to snap near the spine. Papyrus was thus used in flat sheets or rolled into scrolls. In normal conditions it gradually rotted away. The few scraps of ancient papyrus that have survived have done so only because they were preserved in unusual conditions.¹⁹

A vast majority of the writings we have from ancient Egypt were painted on or engraved into the walls of buildings. We know that libraries did exist. Inscriptions list positions such as Keeper of the King's Records, Keeper of the Sacred Books, and Learned Men of the Magic Library, suggesting libraries of some social importance.²⁰ The Temple of Horus at Edfu and the Ramesseum, the mortuary temple of Ramesses II at Thebes, are both known to have had important libraries, but the temple at Edfu belongs to the later Hellenistic period, when Egypt was under Greek rule, and the room itself amounts to little more than a large cupboard with niches in the walls. Iamblichus of Syria (*fl.* AD 270) describes how the library in the Ramesseum contained 20,000 scrolls, but if that was the case nothing now remains to indicate their location or disposition.²¹ Thus for Egypt we have literary references and hints of the existence of libraries but no clear idea of their physical form. The situation is thankfully slightly better for ancient Greece and Rome.

Ancient Greece

The earliest known Greek writings are, like the ancient Mesopotamian ones, on clay tablets. Greek civilization

with great energy, seeking out and acquiring other
tions. Whether he did so by force or purchase is
ar. His library contained books on waxed boards,
ll as tablets, but only the tablets survive. It has
estimated that it held 1,500 works, but each work
have occupied a number of tablets or boards.¹⁴

it and destruction

e the fact that Ashurbanipal's collection is one of
ost important libraries to survive from antiquity
ow little about its original location. Layard found
lets in the ruins of a series of small storerooms
ie main entrance to Ashurbanipal's palace.¹⁵ After
lg's death the library was broken up, so it is not
whether these rooms were their original home or
er they had been thrown there after the palace
oted. From the numerous collections found so far,
ar that the standard Mesopotamian arrangement
have small compact storerooms in which tablets
ept; these were often locked by applying seals to
r.¹⁶ The documents were retrieved from these
when required, to be read elsewhere. The books
lives were not displayed and the rooms were
mundane as a result. The existence of libraries
ent Mesopotamia is culturally significant, but the
ce so far suggests that they were architecturally
resting.



PERGAMUM,
Pergamum, Turkey

Completed, the
at Pergamum
size only to the
andria in the
rld. The remains
the columns that
have formed the
a two-storey stoa
llway) in front
can be seen in
1. The library is
ve been behind
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g onto it.

first began to emerge in what is called the Mycenaean age, between 1600 and 1200 BC. A series of wars brought this early stage to a close and the art of writing then seems to have been lost. When Greek culture emerged from what historians normally term the Greek Dark Ages around 750 BC they adopted the Phoenician alphabet.²² Cuneiform was complicated to learn, requiring the mastery of hundreds of combinations of marks. The Phoenician alphabet reduced the number of combinations to a few dozen letters. This made the process of learning much simpler and promoted literacy. Schools began to appear and the number of people who could read and write markedly increased.

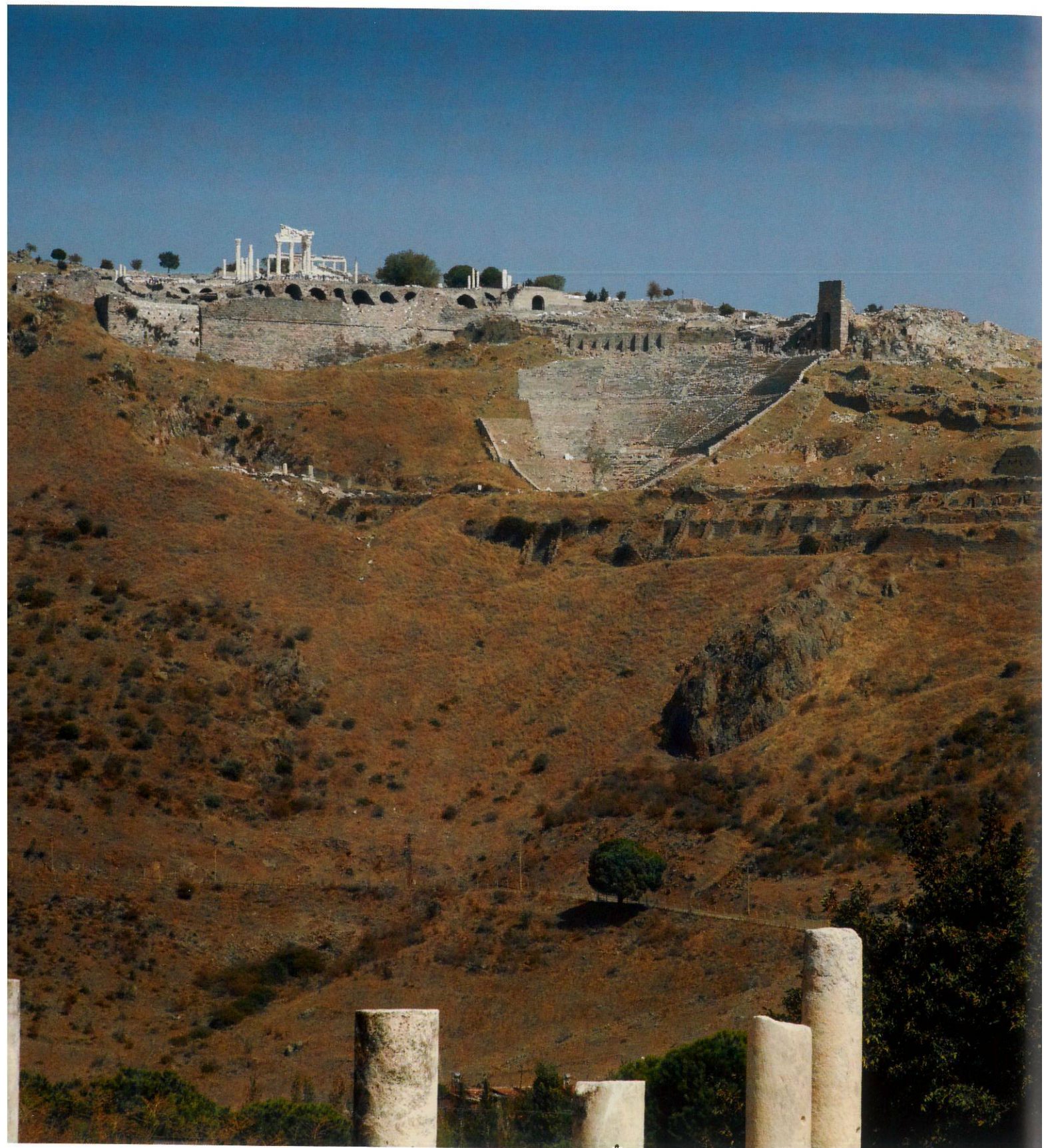
The first Greek books appeared around 500 BC. They were in the form of scrolls, made from papyrus imported from Egypt. The earliest description of papyrus manufacture is an unreliable account in Pliny the Elder's *Historia naturalis* (c. AD 77).²³ More accurate information has been gathered through analysis of surviving material. The stalks of the papyrus plant separate relatively easily into flat strips. These were soaked in water, releasing a natural glue. The strips were then simply overlaid on a flat surface and hammered together in two layers, the lower layer at 90 degrees to the one above. Pressure was then applied and

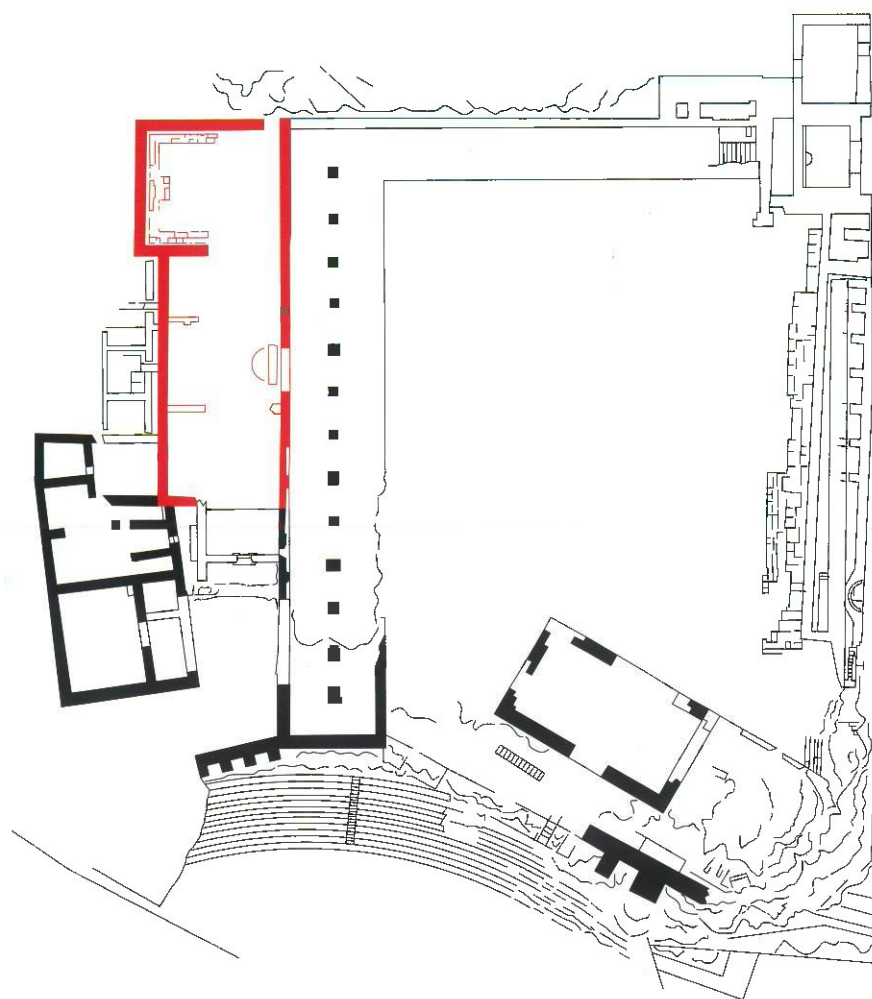
they were allowed to dry. The result was a flat, uniform writing surface that could easily be written on with pen and ink.²⁴ The size of papyrus sheets determined the size of the scrolls. They were generally 20–25 cm (8–10 in.) wide and 19–33 cm (7½–13 in.) high and were typically sold joined into rolls of about twenty sheets, so the average scroll was a 19–33 cm roll which was 2–5 m long (6 ft 6 in. to over 16 ft) if fully unwound.²⁵

The first Greek books were probably scripts for the author to read aloud in much the same way that a lecturer or poet might read to an audience today. Gradually a process of making copies for sale appeared, so that by 400 BC there were booksellers in the major cities, producing and selling manuscript copies of texts. We know people collected books at this time because Aristophanes (c. 446–386 BC) poked fun at Euripides (c. 480–406 BC) for doing so and Aristotle (384–322 BC) was renowned for owning a substantial library.²⁶ No images or physical remains of private libraries from ancient Greece have come down to us. The gymnasia of ancient Greece had libraries, but no library ruins have yet been positively identified.²⁷ The few remains of Greek libraries are from the Hellenistic period. The most significant of these are those of the Attalid library at Pergamum, in modern-day Turkey.

v and opposite
LIBRARY OF PERGAMUM, c. 197–60 BC
Pergamum, Turkey

A view of Pergamum from the sanctuary of Asclepius reveals its strategic position at the top of the acropolis hill. The library is known from written sources to have been in the precinct of the Temple of Athena (marked in red on the plan opposite), which stood on the top of the hill, behind the prominent tower visible at the right of this photograph. The exact position of the library is uncertain, but archaeologists currently place it on the left of this view, on the upper level of a two-storey stoa. Workers working in the stoa would have had a dramatic view of the surrounding landscape.





The library at Pergamum

The city of Pergamum owed its fortune to Philetaerus, a man of humble origins who had risen through the ranks to become an administrator to Lysimachus, one of Alexander the Great's generals. Lysimachus was put in charge of Thrace and from it managed to conquer much of Asia Minor.²⁸ Pergamum was a natural fortress and Lysimachus used it to store much of the treasure he had amassed, leaving Philetaerus in charge. It turned out to be a bad choice. Philetaerus betrayed Lysimachus, siding with one of his enemies, who invaded. Philetaerus became king and the founder of a dynasty, the Attalids, who ruled Pergamum for the next 150 years. His grandson Eumenes II (197–160 BC) founded the library. It quickly became one of the finest collections in the ancient world. As always, the size is disputed. Mark Antony is said to have given 200,000 scrolls from Pergamum to Cleopatra as a gift for the library at Alexandria but this number is probably wildly