The Conservation of Endangered Archives and Management of Manuscripts in Indian Repositories

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By

Anindita Kundu Saha

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Dedicated to
My Parents &
Husband

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FOREWORD
BY PROFESSOR VINITA DAMODARAN

This book is of vital importance to the conservation of historical manuscripts in India, which has a rich repository of such material whose preservation should be of paramount importance to holding institutions and to the nation state. Many of these manuscripts are in dire need of restoration, given the tropical climate, insects and general long-term institutional neglect of historic archives. Written by a leading conservator of manuscripts, this book by Dr Anindita Kundu Saha, an international expert, is a welcome addition to the field of manuscript conservation in India. It highlights the immediate task before us in terms of both preventive and curative conservation, the ways of achieving this and traditions of good practice. It is a must-read for all students of library studies and conservation.

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FOREWORD
BY DR. MANAS BHAUMIK

India is a vast country and its diverse cultural heritage is the envy of other nations. However, it is a Herculean task to conserve this heritage for future generations. Institutes like museums, libraries, research centers, universities, and private collections play an important role in this regard.

The purpose of this book is to identify the valuable cultural heritage of Indian civilization in terms of written manuscripts from the last few centuries, available in every nook and corner of India. It assesses their physical condition, and makes proposals for the care, conservation and preservation of documents for national and international communities.

This meticulous study is divided into seven chapters. It presents information on raw materials and techniques used for the preparation of ancient manuscripts, dating of manuscripts, and their deteriorating agents, which will be very useful for new researchers. The author points out the local efforts to conserve their resources in a traditional way, and proposes an elaborate scientific approach for curatorial conservation to upkeep manuscripts in storage, exhibition, transit, etc. The presentation of the information is so attractive that readers cannot turn to the next chapter without reading the previous one.

It is a great effort by Dr. Anindita Kundu Saha to present the information in a very lucid manner in the field of care, conservation and preservation of archival manuscripts for experts, scientists, new researchers, and the layman.

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FOREWORD
BY DR. SACHINDRA NATH BHATTACHARYA

In India, there are thousands of archives in both the public and private domains. These archives are the repositories of age-old written documents, and some of these archival materials that are gradually becoming endangered need immediate care and protection. Otherwise, there will be a big knowledge gap and the history of civilization could not be analysed or interpreted properly.

To make an academic audit and proper upkeep of manuscripts, the National Manuscript Mission of the Government of India has taken some measures, but due to the lack of experienced conservators the work is not moving satisfactorily. It is also important to mention that during the assessment of the physical status of manuscripts we require experts, as well as skilled museologists and manuscriptologists. Dr. Anindita Kundu Saha's book, *The Conservation of Endangered Archives and Management of Manuscripts in Indian Repositories*, is a commendable work in this regard. Dr. Kundu Saha is a professional museologist and a very reputed conservator who rightly selected a very important area so as to help museologists, manuscriptologists, scholars, fellows, faculty members, curators, conservators and museum managers, etc.

There are very important, illustrated manuscripts bearing the testimony of the rich cultural heritage of India, as well as our global village. If we fail to understand immediately the task for the proper scientific restoration of our cultural heritage, it will be an irreplaceable and irreversible loss not only for India, but also for the global village. To execute such a stupendous task, this book could serve as a text and reference book as it discusses and analyses scientifically all relevant issues regarding archival conservation and management practices adopted for the upkeep of manuscripts. Dr. Kundu Saha has also categorically pointed out the merits and demerits of such rescue work which may enrich and accelerate further research work.

This work is a pioneering work in the field of Museology and Manuscriptology, and I am quite sure that this book will certainly help the museum personnel to preserve, protect and manage the manuscript heritage of both India and the global village.

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FOREWORD
BY DR. PARAMJIT SINGH

India possesses over five million manuscripts that are authentic records of particular eras and throw scattered lights on the social, political, economic, scientific and cultural life of past eras. But these tremendous treasures of knowledge are under threat. They require specialized care and conservation.

I am delighted to know that Dr Anindita Kundu Saha published a book on *The Conservation of Endangered Archives and Management of Manuscripts in Indian Repositories*. The main focus of this book is to provide information about preventive and curative conservation methodology, as well as restoration techniques that could be adopted for the conservation of different types of manuscripts in Indian repositories.

She also highlights possible factors responsible for the deterioration of different manuscripts in the Indian tropical climate in this book. She puts the emphasis on the preservation of manuscripts from biological threats using traditional plant and animal products instead of synthetic pesticides in this book.

I hope this book will help those pursuing Museology, Library Science and Archival Conservation. I appreciate the conscientious effort of the author for bringing out this book. I am also confident that it will certainly help in formulating the required management plan to protect the documentary heritage of our country.

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PREFACE

Since the ancient and medieval period, India has been exceedingly advanced in intellectual activities because of her multiplicity of thoughts, languages, scientific, artistic, cultural, and philosophical perceptions, and her knowledge system. Through the centuries, humankind has diligently recorded its efforts in the written tradition to perpetuate the inquisitive spirit, fortify history and culture, and illuminate the paths of future generations. This written tradition has been come down to us in the form of manuscripts.

Indian manuscript repositories have the richest collection of written documents in the world. A great variety of handwritten manuscripts on parchment, vellum, birch bark, palm leaf, *Agaru* bark, cloth and paper have been preserved in different monasteries, temples, libraries, museums, and archives, with individuals and in several private institutions. It is estimated that India possesses over five million manuscripts, making her the largest repository of manuscript wealth in the world. Manuscripts have played a very prominent role in the development of cultures. They have helped not only in the preservation of the history and culture of mankind, but also influenced the script, language, and people's mode of thinking. Indian manuscripts written in different Indian languages provide information on the existence of different civilizations and the cultural affluence of the nation.

The history of preservation of art objects on paper started since the invention of paper making (105 B.C.) in China as preservation has allowed the keeping of records of almost all of the unfolding history of human civilization.

All creations if they are made of material objects follow the irreversible, inevitable course of decay. There is no exception in the case of manuscripts. Being organic in nature they are very prone to decay with the passage of time. The tropical environment, macro and micro-organisms, overuse and exploitation, lack of awareness and such other factors play an important role in accelerating the degradation and deterioration of manuscript collections in India.

Organised into seven chapters with an introductory part, this book is an attempt to highlight the nature and condition of manuscripts kept in different repositories of India, as well as to create awareness about the

importance of the conservation, care and management of manuscripts. The first chapter describes the materials used in a particular manuscript including various natural base materials, inks, pigments, binding mediums, writing and illustrating instruments, etc. The second chapter deals with different methodologies that can be used for the dating of manuscripts. The third chapter highlights probable causes for the deterioration of manuscripts. The fourth and fifth chapters of the book describe different preventive conservation methods with special emphasis on indigenous practices, curative conservation and restoration techniques that can be adopted for the upkeep of manuscript collection. In the sixth chapter, various care and management practises are described taking into account the available infrastructural facilities, especially in such repositories situated in remote places of India. The last chapter deals with the hazards of using different chemicals for conservation of manuscripts.

The author shall be grateful to all the culturally-conscious populace and authorities of respective museums and other repositories to come forward and undertake all possible steps so as to protect our cultural heritage at any cost- this is the main purpose of this book.

ACKNOWLEDGEMENTS

I wish to acknowledge my gratitude to my supervisor Dr. Sachindra Nath Bhattacharya and all the faculty members of the Department of Museology, University of Calcutta. I am also thankful to all the directors, curators, conservators, guide lecturers, librarian and other museum personnel of forty manuscript repositories which I have visited and surveyed during the tenure of my research work for extending their cooperation at different stages. Some of the repository staff need special mention and they include Mr. Sudhir Kumar Das, former Conservation Officer of Asiatic Society, Mr. P.K. Agrawal, Assistant Chemist of Victoria Memorial Hall; Dr. Ranjit Mukherjee, former Senior Conservation Officer of Indian Museum; Mrs. Malabika Ghose, Conservation Officer of National Library; and Mrs. Sumita Sil, Conservation Officer of State Archives for extending their cooperation at different stages of my research work.

I am also grateful to the authorities of the National Museum, National Archives of India, Asiatic Society, Indian Museum, Bhubaneswar State Museum, Namgyal Institute of Tibetology in Sikkim, Ghoom Monastery in Darjeeling, Government Museum in Chennai, Assam State Museum, Salar Jung Museum in Hyderabad, Serampur College Carey Museum, Sanskrit College Library, Hajarduari Palace Museum, Rajnarayana Basu Smriti Pathagar, Joykrishna Public Library, Bangiya Sahitya Parisad, National Library of India, Victoria Memorial Hall, Academy of Indian Arts, Shree Shree Pathbari Ashram, Malda District Museum, Asutosh Museum of Indian Arts, Rabindra Bhavan (Visva Bharati), Bishnupur Acharya Jogesh Chandra Purakirtishala, Institute De Chandernagar, Rishi Bankim Sangrahashala-O-Granthagar, Sarat Smriti Granthagar, Narendrapur Ramakrishna Mission Ashram, Bidhan Chandra Granthagar, Zilla Sangrahashala Haripada Sahitya Mandir, State Archaeological Museum, Rabindra Bharati University Museum, Sunderban Anchalik Sangrahalaya, State Archives of West Bengal, Akshaya Kumar Maitra Museum, North Bengal University (Department of Bengali), Gurusaday Museum, Sanskrit Sahitya Parisad, Museum & Art Gallery (University of Burdwan), Birla Academy of Art & Culture, Gandhi Smarak Sangrahalaya, Bagnan Anandaniketan Kirtishala, Archaeological Museum Tamluk, The Ramakrishna Mission Institute of Culture, Jatirindra Mohan

Sangrahashala, Manuscript Library (University of Calcutta), Prasanta Chandra Mahalanobis Memorial Museum & Archives, and Nabadwip Purattava Parisad which I have visited and surveyed during the tenure of my research work for their kind cooperation.

My sincere thanks are also due to Mr. Kalidas Banerjee, former Deputy Director of State Archives; Dr. Gautam Sengupta, former Director of State Archaeological Museum; Dr. Bimal Banerjee, former Superintending Archaeologist of Archaeological Survey of India; Mr. Supriya Munshi, former Director and Secretary of Gandhi Smarak Sangrahalaya, Barrackpore; Dr. O.P. Agrawal, former Director of INTACH; Dr. Shashi Dhawan of NRLC, Lucknow; Prof. Aishwarya Kumar Das, Director (Hon.) of Lal Bahadur Shastri Museum, New Delhi; Dr. C.L. Prajapati of National Archives; Mr. S.P. Singh, former Director (Conservation) of National Museum; and Mr. U. Das, former Director (Collection and Administration) National Museum for their support and help in completion of my research work. I am also grateful to all my family members, especially my parents, husband, friends and well-wishers for their moral support and encouragement to carry out the research work properly.

The Author

INTRODUCTION

The art of preservation of cultural material is as old as human civilization itself. In a way, it can be said that such instinct for self-preservation is very common to all people in general. Documents have existed in one form or another since man invented the art of writing, and it has been quite natural for the human race throughout history to try to preserve them, in view of their cultural value. The methods adopted for this purpose have, however, differed from time to time and place to place, depending on the materials used in the creation of such documents. With the passage of time, museums, libraries, archives and private holdings became the repositories of most of the priceless collections of works of art and human knowledge. They serve as the only surviving record of the wisdom and learning of past civilizations, and the loss of any such irreplaceable material would be catastrophic.

It is obvious that every material object starts decaying from the moment it is created. The environment in which documents are stored, overuse and accidental damage, lack of proper care, management and preservation, and other factors can accelerate the degradation and deterioration of the cultural heritage of mankind.

Until the latter part of the nineteenth century in India, the principal method of preserving the text and illustrations of a deteriorated document was to make a transcribed copy. During the past few decades, however, the extraordinary increase in the use of manuscripts for socio-cultural, political, scientific, and technological purposes has created a greater need for scientific conservation of documentary heritage than ever before. Modern methods of photo duplication are a great aid in helping to solve this problem, but photo duplication cannot deter or stop the ongoing deterioration of an original document.

In the post-independence period in India, large collections of archival material have come into the public domain through discovery, gift, purchase or loan, donation, exchange, and the implementation of the Indian Treasure Trove Act (1876). Many organizations with such collections were declared institutions of national importance by the Government of India.

Apart from the central institutions, there also exist a large number of institutions at the state level, particularly university departments, oriental

research institutes, museums and libraries, archives, and private holdings with millions of manuscripts. Many of these receive grants from the central or state government. While there remains a great deal of unevenness in the provision of funds, there has been an overall growth in the resources devoted to these institutions in order to upgrade their infrastructure facilities for conserving, caring for and managing these collections.

India is rich in cultural heritage, but due to a lack of awareness and proper scientific knowledge, hundreds of millions of manuscripts kept in different museums, para-museums and private holdings of India are becoming faded and fragile, and some of them have been reduced to dust.

To make matters worse, most museums, except for some renowned ones, are generally ineffectual in the conservation, care and proper management of manuscripts. Even worse is the condition of small museums and manuscript libraries in India, which have neither any financial aid to protect manuscripts, nor the qualified conservators, curators, or museologists. Many are not even conscious of the value of the manuscripts they hold. If this is the condition of manuscripts in India's official institutions, what must be the condition of those materials lying in the personal collections of the descendants of learned pandits of *tolls* and temples? The total number of manuscripts, the various types of manuscripts, and the present condition of those manuscripts are not exactly known. No substantial work in this direction has been conducted yet.

Keeping in view the various issues and the urgent need for action on several fronts, this book will examine the topic of the conservation, care and management of manuscripts in the repositories of India. To provide an in-depth study, an intensive and extensive analysis of various types of manuscripts kept in different repositories within the geographical limits of India has been carried out to assess the current quality of maintenance of these manuscripts, as well as consider the flaws and problems relating to conservation programmes.

The primary objective of this book is to highlight the present condition of the manuscript collections kept in different Indian manuscript repositories. The specific aims are as follows:

- To understand the maintenance problem pertaining to the collections;
- To determine the extent of deterioration of the manuscript collections;

- To study the conservation practices already adopted by manuscript repositories;
- To give recommendations on how to maximize the life of the collections.

Forty manuscript repositories of India have been selected here as the thrust area of the survey work as a sample on the basis of their rich manuscript heritage, as well as the heritage of their respective localities. Repositories have also been selected to represent a wide variation of environmental conditions like relative humidity, temperature, and pollution levels, as well as types of collection, documentation, and display and storage conditions, and differences in administrative set-up. This vast treasure trove of manuscripts contains the cumulative knowledge of the Indian tradition in the fields of philosophy, science, literature, religion, arts and culture, geography and the pluralistic faith systems that have prevailed in India. Hence, identification, documentation and conservation of these rich manuscript collections are essential for posterity.

Extensive study and fieldwork have been carried out in these 40 selected manuscript repositories, which include museums, archives, manuscript libraries and collections of private holdings situated in city, urban and village areas of India.

Various visual observations, interviews and survey methods were applied to collect the data. Since the total population consisted of over 18,575 manuscripts in the repositories studied, 10% of each collection was selected as a sample and a simple random sampling method was applied. In some manuscript repositories, however, physical verification is still ongoing, and the exact numbers of manuscripts are not even known to the staff working there.

Visual observations during the survey of different manuscript repositories of India and the viva-voce interviews revealed that most problems in the conservation of the manuscripts have stemmed from a lack of awareness regarding the condition of the storage areas, a lack of experts in the field, and insufficient equipment to control the hazards of the environment of the stack and exhibition areas of the repositories. In the management process, the application of new technology is not commonly practiced due to the unavailability of infrastructure and the necessary trained personnel. The significant findings of this study revealed that the establishment of workable conservation policies, conservation units and cleaning programmes is needed immediately to prevent further damage to the collections.

This book is a humble attempt to draw attention to the need for proper conservation, care and management to maintain India's rich documentary heritage. Its intention is to make both Indian and international audiences aware of the deteriorating state of India's national heritage, and to galvanise, as far as possible, the idea that appropriate measures must be taken for the protection of the millions of India's ancient manuscripts.

The first chapter describes the materials used in the making of manuscripts, including various natural base materials, inks, pigments, and binding mediums. It also discusses the range of writing and illustration techniques practised in different types of manuscripts.

During the survey at different manuscript repositories, it was noted with concern that most of the manuscripts were undated. The dating of manuscripts is a very difficult task, and Chapter Two discusses some methods and techniques that are used here.

Chapter Three deals with all factors responsible for the deterioration of manuscripts kept in different manuscript repositories of India. In this study, an attempt has been made to highlight the effect of various physical, chemical and biological factors, as well as other factors such as human vandalism, accidents, and natural calamities, etc.

Considering the urgent need to ensure the protection, care and management of manuscripts, Chapter Four reviews and details some remedial measures adopted by manuscript repositories for the preventive conservation of manuscripts, such as periodical examination, proper documentation, control of environmental conditions inside the repositories, control of biological organisms through various indigenous methods, the Integrated Pest Management programme, fungicides, insecticide, and microfilming and digital preservation methods.

Chapter Five discusses possible measures of curative conservation and restoration practices that could be adopted in a phased manner for the proper upkeep of manuscripts. Curative conservation deals with different methods used to keep the manuscripts in good condition, such as cleaning and the removal of stains, fumigation, and de-acidification, etc. Restoration practices deal with repair, strengthening, lamination, encapsulation and binding. Finally, the chapter also reviews specialized conservation methods for particular types of manuscripts, such as those using parchment, leather, birch bark, *agaru* bark, palm leaf, textile and paper.

Chapter Six summarizes the findings of a careful study of the present status of the repositories, and suggests appropriate measures that could be adopted for the proper care and management of manuscript collections, like proper handling, appropriate display, proper storage, the packaging of manuscripts with suitable materials during transport, and proper transport

of manuscripts. It also suggests appropriate security measures against theft, fire, and flooding, etc.

The last chapter covers various hazards that could be a problem in any manuscript repository as a result of improper conservation, care and management practices.

Finally, an effort has been made to emphasize the urgent necessity to undertake all steps to conserve, care for, and adopt suitable upkeep practices for manuscripts kept in all of the repositories of India.

A selected bibliography of relevant books, journals and e-journals that have been consulted during the study is provided at the end of the book.

CHAPTER I

MATERIALS USED FOR MAKING MANUSCRIPTS

Manuscripts are found everywhere around the world where humans express their thoughts in a written format.[1]The word 'manuscript' is derived from the Latin word *manuscriptus*, which literally means written by hand. Accordingly, it may be stated that any document containing characters, transcribed by hand with a needle, brush, pen, pencil or stylus or other such instrument can be termed a manuscript, as opposed to one printed mechanically. In the modern world, the term 'manuscript' is also applied to type-written material. The National Mission for Manuscripts defines a manuscript as hand writing on materials such as parchment, palm leaf, tree bark, paper, cloth, metal or any other material that is at least seventy-five years old and has an immense scientific, historical or aesthetic value.[2] Manuscripts differ a great deal from historical records. Historical records such as epigraphs on rocks, firmans or revenue records which give direct data on events function as a separate entity from manuscripts.

Manuscripts can be studied not only for the content of their texts, but also as a part of visual culture. The stylistic attributes pertaining to art can be studied, for example by an art critic, in order to explicate the influence and transmission routes that display the relationships between cultures. Some illustrated manuscripts portray several aspects of culture and society of their time.[3]

It is estimated that over 5 million manuscripts are kept in various repositories of India making it the most important repository of manuscript wealth within the world.[4] These manuscripts may be in book form, on scrolls or in codex format. Border decorations, pictures, elaborately amassed initial letters or full-page illustrations were often made to illustrate manuscripts. But this enormous "pool of knowledge is under threat and manuscripts are disappearing at an alarming rate"[1], making specialised care and conservation imperative. For conservation, to take proper care, and for proper management, it is necessary to have a thorough knowledge about various types of manuscript.

The material components of manuscripts are a carrier or support, meaning the substance on which the manuscript is written, and ink. Though human beings have used stone, metal and clay as writing supports over the ages, manuscript supports were principally made from biological materials, i.e. plant and animal materials are considered as they are prone to decay much faster than non-biological ones.[1] On the basis of supporting materials, Indian manuscripts can be classified as manuscripts on:

1. Papyrus
2. Parchment
3. Vellum
4. *Sanchi Pateeya* (Bark of *Agaru* tree)
5. Birch bark (*Bhurjapatra*) *Betula utilis*
6. *Tulipateeya*
7. Palm Leaf—three varieties:
   i) *Corypha umbraculifera* Linn. (*Shrital* or *Talipot* Palm or Fan Palm)
   ii) *Borassus flabellifer* Linn. (The Palmyra Palm, *Tal*)
   iii) *Corypha taliera* Roxb.
8. Textiles:
   i) Cotton
   ii) Silk
9. *Parabaik*
10. Paper:
    i) Handmade paper
    ii) Machine made paper

It has been revealed from the study of various types of Indian manuscripts that different types of inks have been used for writing manuscripts in the past. Ink is the basic material of writing. So, it is essential to study the types and nature of ink used as a writing medium. The diverse types of inks used in manuscript writing are carbon ink, iron gall ink, red ink, blue ink, green ink, golden ink etc.

I. Supporting Materials Used in Writing Indian Manuscripts

Supporting materials used for writing text or painting illustrations on Indian manuscripts are of plant and animal origin. Plant material can either be a leaf taken from a tree or plant to be written upon, or a leaf specially prepared for writing, or the bark of trees, the pulp of plant material dried in

the form of thin sheets, traditional handmade paper, and thin sheets of paper manufactured in modern paper factories.[1] Besides these, material of animal origin has been widely used as a support for writing Indian manuscripts. This animal material can be the skin and/or hide of different animals, for example, the skin of calf, sheep, goat, etc. In addition, silk threads obtained from the cocoons of silkworm can be used as the support of manuscripts.

Studies of diverse Indian manuscripts show that the following types of supporting materials have been used in the past.

Papyrus

Papyrus[5-7]is one of the most important materials in the history of writing. It is an aquatic plant, 2-4 metres high, which grows on the banks of the Nile. The Latin word 'papyrus' is the root of the modern word 'paper'. A papyrus sheet was not manufactured from macerated fibres, so it was not true paper. The scientific name of papyrus is *Cyperus papyrus*. Papyrus was used extensively as a writing material from 3000 BC by the Egyptians, Greeks, Romans and Byzantines to preserve their classical texts.[8,9] The earliest Bible texts were also written on papyrus.[10] Papyrus was used for manuscripts until the 9th century AD, when it was largely supplanted by parchment.

The secrets of the manufacturing process of papyrus was lost since the 11th century AD. To make a scroll, strips were cut down along the length of the plant and a rectangular shape was formed by lying broader parts side by side, and others were then laid across at right angles. Sometimes two layers were bound with adhesive, and by a process of wetting and pressure. They were hammered to make them flat and dried in the sun. The upper side (with the broader strips) was then polished to make it smooth with a piece of ivory or a shell. The best quality papyrus sheets were made from the slices cut from the heart of the plant. The colour of the better quality papyrus was more brownish.

Papyrus was mostly used in roll form for manuscripts. The rolls were formed by attaching the sheets end to end using starch adhesive. Lengths of the individual sheets ranged between 18 and 51 cm.[5] Each roll contained about 20 sheets of papyrus. Codex form of papyrus was also used. Some of the papyrus manuscripts were profusely illustrated with miniature drawings, while some contained only writing. The greatest use of papyrus as a classical material for writing was evident between the 2nd century BC and 4th century AD, its use continuing until the 10th century AD.[6,9]

Parchment

The most common material for writing medieval documents was parchment. Parchment[5-11] is a generic term derived from the Latin word *Pergamena* and the Greek word *Pergamene*.[8] Parchment was made of the skin of sheep, goats or calves.[11] The skin was not tanned just like tanning leather, but a "particular form of extended treatment" was done in it in order to make the skin "fine, supple, flat and white".[11] It was not until the 2nd century AD that parchment became a serious rival to papyrus as a support material. But from the 4th to 15th century AD, it was the standard writing support material of medieval European scribes. Historical evidence showed that the manufacturing process of parchment originated in the ancient city of Pergamon in Asia Minor in the 3rd century BC. Parchment was used to create documents in the form of scrolls in Rome in the 2nd century BC.[10] It was also used in codex form in the first few centuries AD. According to historical evidence, parchment sheets were prepared by using the following methods:[5,11]

In the first stage of making parchment sheet, animal skin was transformed into a clean white material appropriate for medieval manuscript writing. The skin was washed with water and lime, and it had to soak in the caustic soda for a couple of days to dissolve out fat, clean away adhering tissue and remove the hairs.[5,11] The skin was then fastened to a wooden frame by cords for drying of the skin and to prevent tearing.[11] The skin was attached at points around the circumference. The maker wrapped the area of the skin to which the cord was to be attached around a pebble called a 'pippin'. In order to stretch the skin, the lacings were increasingly tightened and a crescent shaped knife, known as 'lunarium' or 'lunellum' was used repeatedly to scrap the hide for getting rid of any extraneous matter. This process preserved flexibility of the skin as it stretched and dried.[10] After completion of the treatment, one could distinguish the hair side of the skin from flesh side by colour and texture, and also by slight concaving of the hair side.

Sometimes pumice stone was used to make the hide smooth by scrubbing, which would also stretch it out thinner.[11] Its intention was to wipe out differences between the skin and hair sides. Chalk was sometimes rubbed into the framed skin to make it white.[11] Thick skins, like those of a calf, could sometimes be split into two layers.[11] Once the skin was completely dry, it would be given a deep clean, and it would be processed into sheets. The number of sheets that could be fashioned out of a piece of skin depended on the size of the skin. Parchment sheets were trimmed neatly into rectangular shape. About four sheets were stacked together, folded and sewn at the fold to form a gathering. The entire manuscript could be bound between boards into a codex. Both sides of a parchment sheet were used for