

Samraksikā

Series 1

Indigenous Methods and Manuscript Preservation

राष्ट्रीय पाण्डुलिपि मिशन

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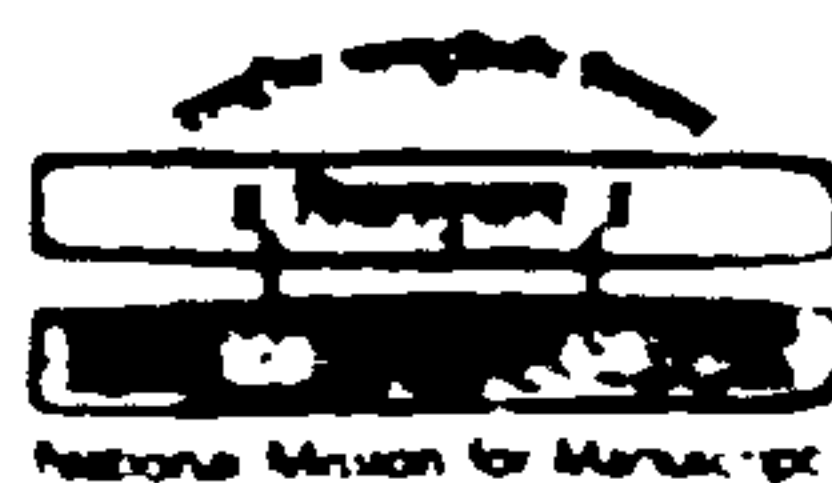
Samrakṣikā Series

The Samrakṣikā Series is the compilation of the papers presented during the seminars organized by the National Mission for Manuscripts. The seminars provide an interactive forum for scholars to engage with ideas related to the manuscript heritage of India and promote a discourse around the knowledge content of Indian manuscripts, relocating the past within the thoughts, debates and cultures of the present.

Indigenous Methods and Manuscript Preservation

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Editor
Anupam Sah



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Preface

THE National Mission for Manuscripts was established in February 2003 by the Ministry of Tourism and Culture, Government of India. With India's manuscript collection estimated at almost five million, the Mission, through nation-wide networking of institutions, is in the process of locating, documenting and digitizing this textual heritage of the country. Further, the Mission has also been engaged in the conservation and preservation of manuscripts; and rendering accessible their knowledge content through lectures, seminars, school programmes, and further, through bringing out critical editions of significant texts. The Mission has a mandate of creating a first of its kind National Electronic Catalogue of all the manuscripts.

The practice of writing, preserving and worshipping the "word" has been an age long tradition in India. Over centuries the "written word" — the manuscript, has been the vehicle of cultural legacy from the past, on various aspects of Indian philosophy, culture, politics and science. A tradition that saw *vidyā* as the only real *dhana* can now legitimately take some pride in the fact that the world has come to recognize knowledge as the key resource for change. In an attempt to reconnect with the Indian knowledge systems, the National Mission for Manuscripts began a Seminar Series called "Samrakṣikā." The Series seeks to bring to a common platform the theories, methods, experiences and cultures around the

manuscript heritage of the country. This is the first volume of the Series, a compilation of the papers presented during the first National Seminar organized by the Mission in February 2005. In collaboration with the Indira Gandhi National Centre for the Arts, the Seminar "Oral Traditions and Indigenous Methods of Preservation and Conservation of Manuscripts" presented various aspects of manuscript preservation, and a series of technical sessions to bring together the textual, methodological and practical aspects to the same platform. Along with the Seminar, the Mission had also put together an exhibition to showcase these techniques.

The first of the *Samrakṣikā* Series, this Seminar was devoted mainly to conservation, a crucial aspect in manuscript studies, and one of the most significant activities of the Mission itself. The Mission has been involved in organising workshops for imparting conservation training to a vast range of students and professionals. Through nation-wide Manuscript Conservation Centres and a larger network of Partner Centres the Mission has a sharp focus conservation methodology and research. Sustained in India through centuries, these systems include traditional techniques of preparing various types of writing surfaces and inks, ways of preservation and storage of manuscripts. For centuries, holders of manuscript collections in India have used various natural organic and inorganic materials for protecting and treating their manuscripts. Due to the advent and widespread availability of synthetic chemicals, changes in the social, agrarian and living systems and other factors, the oral traditions, practices and knowledge systems of traditional methods of conservation of manuscripts have fallen into disuse.

To highlight the traditional systems of conservation of manuscripts, the National Mission for Manuscripts has now

brought together this collection of papers on indigenous methods, materials and practices for conservation of manuscripts. The Seminar was an effort at bringing together a group of people who shared their experiences and ideas, and formulated a plan of action for the revitalization of that knowledge. It was also an effort to formulate recommendations related to exploring the efficacy of these age old techniques as well as explore oral traditions related to manuscripts. The papers in this Volume will reflect various ideas, questions and suggestions which came up in course of the Seminar. They deal with a wide range of themes — preparation of writing materials, making of inks, the use of plants, herbs and fruits in preservation of manuscripts, the effect of environment on manuscripts, and a range of indigenous practices of manuscript conservation.

This book is perhaps the first such attempt of its kind to enhance knowledge relating to the conservation of manuscripts in India through indigenous methods. We hope that it will contribute to the Mission's attempt in protecting India's rich and vast manuscript heritage.

Dr. Sudha Gopalakrishnan
New Delhi, 2006

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The organization of the Seminar was possible because of the support staff of the National Mission for Manuscripts. The Mission acknowledges the contribution of D.K. Rana, Sanghamitra Basu Gitanjali Surendran, Neha Paliwal, Neeraja Gopi, Shibani Murlidhar, Samir Krishnamurthy, Prabhat Kumar Das, Abdul Razique, Kakul Fatima, Anurag Arora, Yashaswini Chandra, Reena Rawat, K.K. Thapliyal and J.P.S. Tyagi.

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Key to Transliteration

VOWELS

अ <i>a</i>	आ <i>ā</i>	इ <i>i</i>	ई <i>ī</i>	उ <i>u</i>	ऊ <i>ū</i>
(b <u>u</u> t)	(p <u>a</u> lm)	(i <u>t</u>)	(b <u>ee</u> t)	(p <u>u</u> t)	(p <u>oo</u> l)
ऋ <i>r̥</i>	ए <i>e</i>	ऐ <i>ai</i>	ओ <i>o</i>	औ <i>au</i>	
(r <u>h</u> ythm)	(p <u>l</u> ay)	(a <u>i</u> r)	(t <u>o</u> e)	(l <u>o</u> ud)	

CONSONANTS

Guttural	क <i>ka</i>	ख* <i>kha</i>	ग <i>ga</i>	घ <i>gha</i>	ङ <i>ṅa</i>
	(s <u>k</u> ate)	(b <u>l</u> ock <u>h</u> ead)	(g <u>a</u> te)	(g <u>h</u> ost)	(s <u>i</u> ng)
Palatal	च <i>ca</i>	छ* <i>cha</i>	ज <i>ja</i>	झ <i>jha</i>	ञ <i>ña</i>
	(c <u>h</u> unk)	(c <u>a</u> t <u>ch</u> <u>h</u> im)	(j <u>o</u> hn)	(h <u>e</u> d <u>g</u> ehog)	(b <u>u</u> n <u>ch</u>)
Cerebral	ट <i>ṭa</i>	ठ* <i>ṭha</i>	ड <i>ḍa</i>	ढ* <i>ḍha</i>	ण* <i>ṇa</i>
	(s <u>t</u> art)	(a <u>n</u> th <u>u</u> ll)	(d <u>a</u> rt)	(g <u>o</u> d <u>h</u> ead)	(u <u>n</u> der)
Dental	त <i>ta</i>	थ <i>tha</i>	द <i>da</i>	ध* <i>dha</i>	न <i>na</i>
	(p <u>a</u> th)	(t <u>h</u> under)	(t <u>h</u> at)	(b <u>r</u> ea <u>th</u> e)	(n <u>u</u> mb)
Labial	प <i>pa</i>	फ* <i>pha</i>	ब <i>ba</i>	भ <i>bha</i>	म <i>ma</i>
	(s <u>p</u> in)	(p <u>h</u> ilosoph <u>y</u>)	(b <u>i</u> n)	(a <u>b</u> h <u>o</u> r)	(m <u>u</u> ch)
Semi-vowels	य <i>ya</i>	र <i>ra</i>	ल <i>la</i>	व <i>va</i>	
	(y <u>o</u> ung)	(d <u>r</u> ama)	(l <u>u</u> ck)	(v <u>i</u> le)	
Sibilants	श <i>śa</i>	ष <i>ṣa</i>	स <i>sa</i>	ह <i>ha</i>	
	(s <u>h</u> ōve)	(b <u>u</u> s <u>h</u> el)	(s <u>o</u>)	(h <u>u</u> m)	
Others	क्ष <i>kṣa</i>	त्र <i>tra</i>	ज्ञ <i>jña</i>	ळ* <i>ḷ</i>	ऋ* <i>ṛ</i>
	(k <u>ṣ</u> atriya)	(t <u>r</u> iśūla)	(j <u>ñ</u> ānī)	(p <u>l</u> ay)	

अं (—) *m anusvāra* (nasalisation of preceding vowel) like *samskṛti*

अः *visarga* = *ḥ* (aspiration of preceding vowel) like (*prātah*)

s *Avagraha* consonant #consonant (like:- *ime 'vasthitā*)

Anusvāra at the end of a line is presented by *m* (म्) and not *m̐*

* No exact English equivalents for these letters.

Introduction

OVER millennia, India's knowledge systems had been nurtured through the medium of speech — spoken, heard, remembered and developed. Subsequently the written word manifested itself in various forms and developed through a profusion of media. The imagery of words was itself complemented with diagrams and illustrations. Much of what has come down to us in the written form through manuscripts and spoken medium through oral traditions is sacred, both in content as well as in the physical form. These are relevant today as much for their historicity and aesthetic appeal, as for the knowledge contained in them.

In the first week of February, at the cusp of winter and spring of 2005, in New Delhi, under the umbrella of the National Mission for Manuscripts, traditional practitioners from different parts of India demonstrated how paper was created from plant fibres, ink was prepared, pigments were ground and manuscripts created. At the same time, a group of librarians, archivists, historians and conservators were invited to come together and deliberate over three days on oral traditions as well as on the methods, materials and techniques of conserving manuscripts through minimum dependence on synthetic chemicals, relying more on plants and their products.

There was a need for such a deliberation at this stage when the National Mission for Manuscripts is surveying and

documenting manuscripts throughout the length and breadth of India. With libraries and repositories shouldering the responsibility of conserving their already large collections, there is now a movement to encourage and empower individual collectors in villages and towns to look after their manuscripts themselves. The use of local practices and medicinal plants to help conserve local manuscript heritage is more easily understood and accepted in villages and small towns than the use of “chemicals.” It is also perhaps safer as well as economically easier for the ordinary people in possession of manuscripts to use them. The reality that many custodians of manuscripts prefer their sacred manuscripts not to be “defiled” by the use of synthesized chemicals also precipitated the organization of *Samrakṣikā*, this seminar on “Oral Traditions and Indigenous Methods of Preservation and Conservation of Manuscripts.” The seminar lasted three days and the exhibition on the same theme lasted a week.

The presentations were accompanied by group discussions with interventions in between. A set of recommendations was framed during the course of the seminar. Papers were presented both in Hindi and in English. Those in Hindi were translated into English for this publication, while the interventions were transcribed from the recordings.

The keynote address in this volume is based on the lecture by O.P. Agrawal in which he provided an introduction to the variety of traditional conservation practices in India and hoped that the deliberations lead to a systematic research and testing of traditional conservation practices and materials before advocating their efficacy. K.K. Gupta gives an overview of the various plants that have been identified for their insecticidal properties that could be applied also for the material conservation of manuscripts.

Complimenting the written manuscript tradition, Jyotindra Jain stresses on the nature and importance of the oral tradition and says that it must be preserved in its oral form so that it can continue to be a document of culture right up to contemporary period. G.N. Devy, however, eschews the distinction of written and oral traditions as two different categories especially as speech is domesticated in writing. He brings forth the element of pictographic writing/oral tradition and observes that metaphysical leanings of different cultures must be considered as they affect our interpretation of respective written and oral traditions. That a vast number of our people have remained “illiterate” and yet have a vast amount of knowledge with them should remind the National Mission for Manuscripts that the relations between knowledge and script, truth and script and speech and script should be considered in our diverse cultural contexts. Interventions at this stage touch on issues concerning the use of indigenous terms and whether indigenous populations are willing or are able to preserve their traditions.

Heather Brown stresses the importance and possibilities of the collaboration and cooperation in both the specifics of “conservation” and in the broader interconnected strands of “preservation” that included preservation microfilming and digitization. Ms Brown suggests that microfilms produced and stored to rigorous standards could outlive in practicality the digitized version of our manuscripts.

Shreenand Bapat’s paper deals with the literary evidence of manuscript conservation practices in ancient and medieval India. V. Jeyaraj, P. Perumal and C. Maheshwaran explain how Palm-leaf manuscripts have been preserved through natural means in Tamil Nadu. An introduction to the manuscripts of the Tawang monastery in Arunachal Pradesh is provided by

M. Motebennur and N. Phuntso and this is followed by a paper by Anupam Sah on the revival of the forgotten manuscript traditions. Ritu Jain's paper traces the changes to the paper-making traditions of Sanganer. S. Mandal and S. Maiti's paper dwells on the scientific analysis of India's indigenous methods of manuscript preservation.

J.B. Shah provides insights on the approach of the Jain community in India to the preservation of manuscripts and of the knowledge contained in it. The tradition of conservation is inherent in their way of life, in the Jain *Dharma* and is explained through examples in this article. Article by Usha Suresh provides an insight into the lesser-known *kadata* that is peculiar to the state of Karnataka in south India. Manuscript formats similar to the *kadata* can also be seen in South-East Asian countries.

The presentation by C.N.K. Alahakoon from Sri Lanka traces the vast array of natural materials and processes used for conservation of the Palm-leaf manuscripts in Sri Lanka. In Majuli, an island in the north-eastern state of Assam, lives Shri Buddhindranath Barpathak who still practises and teaches the art of creating the *hāṁsī pat* manuscripts made from the bark of the *agaru* tree. With the help of Mr Barpathak, Bhupen Goswami has prepared the article on *sāñcī (hāṁsī) pat* making and preparation of ink peculiar to Assam. Mr Utpal Das, a research scholar from Assam follows with a paper that gives an introduction to the history of Assamese manuscripts and then after an interview of the locals, analyses the reasons for the disappearance of the *sāñcīpat* manuscripts and offers some solutions. K. Sushila Devi's article on the manuscripts of Manipur and their conservation also brings to light the fact that the traditional scholar was engaged in all stages of the

production of the manuscripts. The practice of “burying for preservation” is also explained in this article.

Imtiaz Ahmad’s article draws our attention to two Persian texts that devote a major portion of their contents to tools and techniques of penmanship and also provide bits of information on ensuring the longevity of the manuscripts. W.H. Siddiqui examines in his article the development of writing and its spread in the Islamic world. He then introduces the conservation practices at the Rampur Raza Library, an important repository of Islamic manuscripts.

The papers and their respective interventions are followed by a set of recommendations on the following topics:

- (i) Research on traditional practices and materials for conservation of manuscripts,
- (ii) Documentation of traditional practices of conservation and oral traditions related to manuscripts preparation,
- (iii) Application of traditional conservation practices and research, and
- (iv) Revival of traditional manuscripts making, technology and writing traditions.

The variety of papers in this volume containing a large wealth of information is the first effort of its kind to concentrate on India’s strength in the area of manuscript conservation. This volume could be of interest to professionals as well as to the lay reader. Each article could be a seed waiting for someone to help it sprout into an activity that will contribute to carry on our manuscript and oral traditions further into the future with us, nurturing them perhaps through yet more millennia to come.

Keynote Address

O. P. AGRAWAL

THIS seminar aims at studying the traditional methods and products which have been used in our country over centuries, even millennia, in conserving cultural property. This cultural property is not a single item, neither are manuscripts of a single type. They can be on Palm-leaf, paper, bamboo leaf, *hāñsī pat* and other material. Cultural property includes other artifacts and even buildings, created in different periods and different styles in various places. None of this can escape the harshness of the elements and other agents which are often termed as factors of deterioration.

One of these factors of deterioration is insects, and these devour a variety of materials, especially wood and paper. Then there is fungus that attacks almost all types of manuscripts, except birch bark. There is an instance of a birch bark having been repaired using paper, and after some time, due to improper care the repaired manuscript was attacked by insects which destroyed only that portion of the manuscript that had been repaired using paper. The rest of the birch bark was left intact. Is that an indication of birch bark itself being an insect proof material, and could it be used to help conserve manuscripts?

Amongst other factors of deterioration, climate affects all materials in a profound manner. Not only large wooden sculptures and architectural timber are affected resulting in cracks, but the delicate manuscripts too contract and expand with changes in relative humidity in the atmosphere. The constant variation in relative humidity brings about a change in the dimensions of the manuscript. When a manuscript folio is pasted on board or some other support, it cracks apart when the board expands or contracts. Light causes fading of the inks, while atmospheric pollution, both natural and man-made, darkens some pigments, especially lead pigments. Improper storage, incorrect handling and careless transportation damage our cultural property even more.

Conservation of cultural property deals with the control of these deterioration factors and the removal of their negative effects on these objects. In order to conserve, we often need to use chemicals many of which are toxic, costly and not easily available. Even the commonly used para-dichlorobenzene and naphthalene balls are toxic to some extent. What is the alternative to the use of these chemicals? This is what we have to examine during this Seminar. It is in this context that the use of indigenous products and practices takes relevance, and it is not only Indian materials and practices but also those of other countries that we should study and adopt.

Some studies were undertaken (by O.P. Agrawal) in 1979-1980 for UNESCO and the results were published in the book, *Appropriate Technologies in the Conservation of Cultural Property*. One of the articles (by O.P. Agrawal) is printed in that book under the title of "Appropriate Indian Technology for the Conservation of Museum Collections." In this study, information was collected on insecticides and fungicides that have been traditionally used for the preservation of materials.

The first indigenous insecticide that comes to mind is from the neem tree, margosa, which has been used for millennia for its medicinal properties. This tree is very common and the neem leaf has been used widely. Neem seed is again more potent than the leaf. The oil of neem tree is very effective for the conservation of wooden objects. To illustrate the use of neem leaves, there is this incident to narrate, V.S. Agrawal an official of the Archaeological Survey of India in the 1980s once visited the Central Museum in Jaipur and wanted to inspect the condition of a carpet stored in a wooden box for the last 25 years in the *tośakhānā*, the royal store. The box was opened and heaps of dry neem leaves removed from it. To his amazement he found the carpet in a very good condition and attributed the absence of damage to the large quantities of neem leaves placed with the carpet in the box.

There are other materials such as *Ghoda bac* or sweet flag, which have been used at the Oriental Research Institute in Baroda for almost 35 years, and are still being used for the preservation of collections. Tobacco, black cumin, pepper, camphor, turmeric and other natural products have been commonly used since ages in India, so have fungicides such as the phenolic fumes of *ajvāin*, carum been used.

The use of these materials has been propagated by word of mouth, by use and by example. Decades ago children were told that snake slough and the colourful peacock feathers help one to learn better if they are placed within the pages of the school text book. Whether the children believed it or not, they often placed the peacock feathers within the books and when one observes these books, they are still intact with no signs of insect induced damage. Did this happen due to the presence of a copper compound or a sulphate, in the colourful peacock feather? Is the snake slough poisonous? These are questions

that need to be addressed. As the practice of much of this traditional knowledge is diminishing, there is need to document these before they disappear altogether.

Traditional materials and practices must be explored even for other purposes such as adhesives, consolidants, detergents and cleaning agents for use in conservation. While flour paste that is generally prepared is not very flexible when it has dried, wheat grains after being soaked in water, when squeezed, release a milky fluid that when heated and made into a paste is very flexible. Tamarind seed paste is weak, flexible and has been used as an adhesive as well as a consolidant in miniature and even wall paintings. It is now important to start thinking in terms of research. *Rīṭhā*, soap nut is slightly acidic and has been used for centuries in India for washing silks and woolens. *Śikākāī* or Acacia Concinna has been extensively used for washing silks and woolens as well as hair. For cleaning metals, the pulp of *imlī*, tamarind, has proved very effective as it contains tartaric acid and tartarates. In order to prepare the Palm-leaf manuscripts for writing on, various oils are applied such as those of *gingili* or *til*, mustard, lemon grass and citronella, wood oil in Thailand and *dummela* oil in Sri Lanka. Other preservation practices are those of hanging palm leaves in kitchens where they are exposed to fatty vapours and smoke, cleaning with hot sand and baking in kilns as is done in Thailand.

During this Seminar it is expected that the speakers will share their various experiences of use of such traditional practices and materials. This should then lead to systematic and scientific research which should be multi-disciplinary, involving conservators, chemists, entomologists, botanists and others. It is necessary to take this research forward, assess the shortcomings, pursue the positive results, and thoroughly

test the products before putting them to use and advocating their efficacy.

Interventions

A.S. Bisht: Many of the conservation professionals from India have been abroad for training at some point of their professional career. We learnt many conservation processes, and looking at the West, we brought in the use of various chemicals to preserve our cultural heritage. While there has been an emphasis on the use of chemicals, the resultant environmental pollution due to these chemicals was hardly ever considered in the past. The chemicals used by custodians of collections and by conservators were never considered toxic. As time passed, the problems which accost our cultural heritage have, however, remained. It is thus very important for us to analyze natural products with the view of solving our problems in conservation. If not, it is doubtful if it will ever be done in future.

Jyotindra Jain: When I was asked to chair this session, I thought that I would not have much to contribute as this would concern with technical preservation of manuscripts. One sees now that the scope of the Seminar includes the conservation of the oral traditions along with the material conservation of the manuscripts. I congratulate the organizers of this National Seminar, for keeping in sight the other rich side of texts and manuscripts, which does not have a material form but resides in narratives, folklore, mythology, and in the cultural documents contained in oral traditions.

I would like to say a few things about oral traditions, its nature and importance. In the context of Vedic tradition, for example, there is a question of remembering, memorizing and preserving the text in its purity. This idea of purity leads to

an idea of authenticity and then to an idea of tradition and the preservation of the traditional text. When we talk of preserving a certain Vedic rendition in its purity and therefore allowing only a certain community, certain individuals to recite in a certain manner, under a certain guru, so that the purity is not lost, what is important in that is the idea of preservation in purity.

When comparing this with tribal and oral traditions, I feel that the merit lies exactly in the opposite; the idea is not only to preserve the tradition in the original form but also to listen to the various renderings that occur. Each version that one gets is extremely important because by doing a comparative study of versions of renderings we arrive at a better meaning and a better understanding of the subject.

The prominent Hindi writer Shri S.S. Vatsyayan once gave a series of three lectures at the South Asia Institute in Heidelberg University where Dr. Sontheimer, one of the foremost scholars in oral traditions also worked. Dr. Vatsyayan talked of the problems of transformation of oral traditions in writing, and how when an oral tradition is put to writing it comes to an end, by becoming like an object in a museum, out of context. Oral tradition by its very nature can circulate anywhere; it is continuously on the move and a document of culture right up to the contemporary period.

Learning and Aphasia

Reflections on India's Oral Tradition

G.N. DEVY

Abstract

This paper discusses the place of oral compositions in literary traditions of modern Indian Languages by focusing on the nature of oral textuality and the modes of conservation of those texts. It also addresses the relationship between the written and the oral, including the interchange of textual features between the two. The wealth of oral scripts and texts in India is phenomenal. It is necessary to think of ways and means of conserving these texts for the purpose of their dissemination since oral traditions are facing the danger of aphasia in our times. The aim of this discussion is to draw up tasks and the strategies to accomplish the tasks from a national perspective.

Introduction

We are standing at a precious moment in the intellectual history of India, and there are a number of questions that are bothering me. I am here to raise these questions before the audience and not the answers that I have arrived at. I felt interested in oral traditions and during the initial days I thought that the issues in oral traditions would be philosophically, if not historically, relatively simpler and less complex than the issues

found in written literary traditions. However very soon this illusion was broken and I realized that in oral traditions, the transactions are as complex. Going a step further, I realized that it is not possible to think of written and oral tradition as two different terms at all.

Speech and Writing

This fact that written and oral traditions are not different was brought to my notice by a pair of illiterate entertainers from Maharashtra who performed an interesting feat of translation. These two stood two hundred feet apart from each other, a distance visually clear but not orally so. I whispered in the ear of one of them, sentences in Sanskrit, Marathi, Hindi, Gujarati, and a French visitor whispered a sentence in French. This person then used his fingers and palms to signal and the person on the other side spoke out precisely the same sentences. They said that their families have been practicing this knowledge for the past 400 years. In their non-scripted transmission there was sound. In their transmission that did not use orthography, there was a great ability to interpret sound in almost orthographic terms. What was spoken was written as well.

This brought me back to something that is a common sense observation but one that I had forgotten since I went to school. All writing is speech. Speech not only precedes writing, but speech also lives and is domesticated within writing. Some critics of English literature told me that Indian poetry is very sentimental. I tried to figure out if Indian sentiment is more sentimental than the sentiment in English poetry. I concluded that it would be stupid to attempt any such comparison. I came to the conclusion that the linguistic devices within the poetic tradition in India, that are more sensitive to the speech

traditions and speech habits of the audiences, perhaps bring about some of those elements.

Written and/or Oral Traditions

A.K. Ramanujan, who I admire, said at one place that in India everybody knows the *Mahābhārata* because no one reads it. Whether the *Mahābhārata* is written or whether it belongs to the oral tradition is a difficult question for me to answer. We know that at some stage it becomes a collection of heroic tales. It comes from an oral tradition, from many traditions; it then gets consolidated as a text, and then gets authenticated and standardized. Then again, we think in terms of folk *Mahābhārata*, tribal *Mahābhārata*, and then we compare. Within our society, is then the existence of the *Mahābhārata* "activity," the *Mahābhārata* "culture," a written or an oral tradition? I cannot answer this question with any degree of confidence even now.

Prof. Jyotindra Jain has worked on Pithora paintings. These are made by illiterate *Ādivāsīs* in Gujarat and in parts of Madhya Pradesh, and these painters are called *lakhara*, the ones who write. Is this Pithora image a painting, or can we also call it writing? Is it a pictographic writing tradition? Are there some traces of pictographic scripts in these images that developed in this country and were left behind after the decline of Buddhism? It is difficult for me to say whether the awareness of writing is there in the painting, even though it is clear to me that the painting does write the history of the people as well as the cartographic description of the people. The painting is like the map of the area, with the Narmada in the South and the hills in the North with the river flowing. Is it an oral tradition? There is of course the oral narrative, and in fact there are several narratives that keep changing. Once again I do not know whether it is an oral or a written tradition.

Metaphysical Attitudes

I am raising and presenting these rather childish and simple observations to point out the fact that our entire metaphysical attitude to this world, to the meaning of the world and to the truth of this world has remained different from that of others. This has affected our relationship with the written and the oral differently than that metaphysical attitude available elsewhere, such as in China, where a scholar like Jiang Ro argues that the distinction between truth and reality does not exist in the Zen School of Chinese Metaphysics. What the mind perceives as existing and what really exists, that 'Truth' and 'Reality' distinction, is infact the same. In the West what is truth is understood very differently than as is understood in various Indian traditions.

Truth by Writing

I do not know if in other countries too, in a court testimony, one has to say aloud after touching a written text that one will tell the truth and nothing but the truth. Is 'Truth' achieved by writing alone; if the thing is not written then it is not the truth? This is a problematic thing for us. Therefore, I think we need to look at the question of manuscripts in this Country very differently.

Historical Realities of the Indian Subcontinent's Scripts

In this Country there have developed a variety of scripts that are competing with each other, but not conflicting. A very large number of scripts are available in Indian traditions including those that have disappeared. There are some scripts that are used in schools while some are not used. There are languages without scripts, languages with a notion of scripts different than the ones written on paper or rock, but which

have an awareness of orthographic representation of the language outside of the spoken word. These are far too many and the creation of such a range of scripts, allowing so many languages to exist, coexist, intermingle and yet not destroy each other, is an admirable fact. Therefore, these historical realities of our metaphysical bents should be necessarily considered by the National Mission for Manuscripts.

Concluding Remarks

It would not be enough to just document our manuscripts digitally or in print or record in whatever format we have at our disposal. (I put ten tribal languages in print and still curse myself for that. It created social impacts that I had not foreseen. This, however, is not the right time to talk of print capitalism, illiteracy and poverty.) In this Country there are, according to the 1971 census, almost 110 languages, each one is spoken by more than 10,000 individuals and only twenty of them are listed. One feels it is necessary first to challenge the established contemporary notion of aesthetics. We have to begin with a new National, not nationalistic, sense of aesthetics that has to be brought centre stage in our intellectual discourse. Subsequently, we have to see why and how such a vast number of our people have remained illiterate, and yet have such a vast amount of knowledge with them. The relation between Knowledge and Script, between Truth and Script, Speech and Script, all these relationships are problematic for us differently than elsewhere. My humble submission at this juncture, when the oral and written traditions are being seen as one part of a larger spectrum, is that we must make an effort to make a larger beginning.

Interventions

Anupam Sah: Working in the field of conservation, and when working with traditional craft skills and with craftsmen, one sees that the terminology used often has Latin, German, Italian and English elements. While this practice is perfectly fine, the exclusive use of these, and a complete non-use of traditional and local terms may also create a divide between the traditional progenitors of these art forms, our craftsmen and those of us who document them and present them at such venues and seminars. When we do not use the local terms, often most of us err when forcing English equivalents of these local terms into our vocabulary. We also often err because of our shallow understanding of occidental terminology. At the same time, the actual practitioners are also unable to share the platform with us. They often feel their art form itself is inferior, its material and technology and nuances not considered worthy of being expressed in their local language. Language is a subtle but powerful medium to effect change and development. Would it be worthwhile to also start using our traditional and local terms when writing and reporting our work?

G.N. Devy: Those who do not know these traditional terms feel comfortable with them. A villager is comfortable in my speaking English with Dr. Jain, but perhaps I may not be comfortable talking the village language with that villager. Most Indians are bilingual and they tolerate, celebrate and relish the bilingual situations of communication. Turning someone's lack of language into a knowledge opportunity for oneself and this has often been done by us, is a social sin and should be avoided.

There is a danger in developing Indian terms as such, especially because we have many languages and no one Indian language. Linguistically, it would be impossible to have one

term. The use of such terms could also actually nurture a mindless nationalistic pride with political connotations. We know what the Orientalists did with terms by bringing about a difference in their spelling and local pronunciation. We have now got into the habit of using these terms and we tolerate them now.

Ratna Basu: When we talk of terminology we tend to either not understand, or to misinterpret and misrepresent when we are not able to use the categories used by the local practitioners themselves. When we look at English terminology, the kinds of categorizations that have come are very definitive in terms of how the English looked at their own literary history and their genre distinctions as they exist. In addition, when dealing in the social context were categorizations of a socio-political management, and having borrowed the same structure of thought and also of running the political distinctions and tensions and conflicts in the categories and having laid certain rules, in which we used the same structures and linguistic categories, we do sometimes then are not trying to understand. We insist that the categories have to be universal and have to be understood. But what is being understood is not the same as is being conceived or perceived by the members of the local community themselves in relation to their heritage. I wonder if we can come to a definitive conclusion. This remains a burning issue.

G.N. Devy: I do not disagree with you. For different fields, however, it works differently. In the case of written music, of more recent origin, our vocalists trained in the Indian way are comfortable with categories and they can use terms like *rāga* and *tāla* even when talking in English. In computers, for example, we have to use terminology developed in Japan and America. Any field that has developed its indigenous

contemporary philosophy will have earned the right to devise a set of terms for its contemporary use, not till then. We have to earn the right to use our own terminology by developing a philosophy for our discipline. This itself would change from discipline to discipline. This is why the dialogue between allopathic medicine and Āyurveda has been a very difficult dialogue. In fact, they were two monologues rather than a dialogue, and that has been so because the contemporary philosophies of these two systems are not available with us now.

O.P. Agrawal: The terminology that we are discussing is that which is used to describe a certain practice. I suggest we use the local terms and give an equivalent term in English or Hindi or any other language. In Japan too they use their local terms and give an English equivalent. If we stop writing and reporting our work using local terms, then other than not being able to express ourselves correctly, we may even forget one day the terms actually used by the practitioners.

Maltesh Motebennur: Do we need to educate our *ādivāsīs*, the aborigines, and if we do then will their oral traditions be affected?

G.N. Devy: Before we begin to educate our *ādivāsīs*, we must learn from them, otherwise we would be doing to them what Macaulay did to us. There was this film in which a man was trapped in a cave and as a journalist needed a story, the trapped man was kept there. Let the *ādivāsīs* decide what is good for them. If it helps them in their life, they will carry that tradition forward. These traditions do not always need an artificial respiration. I do not think I will preserve their tradition thinking that if I do not do it, the tradition will disappear. Rather I would preserve it if I feel that there is something in it to learn from.

Jyotindra Jain: Are the *ādivāsīs*, the tribals, really in a position to decide for themselves? They are not two static entities, the tribals and the non-tribals. If we bring forms of administration, forms of education, information through television or through other forms, and then they develop aspirations for other jobs is there any possibility left for us to say that they can decide? I think they are not in a position to decide.

G.N. Devy: There is cause for concern and one can worry a lot. In three centuries of our history of the onslaught of colonization and enslavement, the *ādivāsīs* have remained where they were because of their innate strength.

Jyotindra Jain: In our democratic aspirations we strive to incorporate them in the mainstream. For the British, the *ādivāsī* communities were peripheral and therefore were left as they were by default. If they are asked today, they would definitely opt for good concrete housing, fine jobs and many other things perhaps leaving many of their traditions, written and oral.

The Sacred Thread

HEATHER BROWN

Abstract

This paper deals with the importance of using traditional methods preservation in conjunction with the modern techniques to achieve a result, or “hybrid solutions.” It further addresses the important role that the librarian has to play in terms of recording what has been conserved, microfilmed, digitized etc. It also touches upon the role of the mission in this regard as well as other issues including the importance of copyright issues and handling and treatment of the manuscripts themselves.

Opening Remarks

In contrast with the majority of papers at this conference that will deal with specific examples of indigenous conservation techniques, this paper is essentially an overview. From this broader perspective, it uses the analogy of the “sacred thread” to identify the complex and interlinked strands that can contribute to the preservation of India’s heritage.

Background to Analogy

The sacred thread, *Upavīta*, is an integral part of traditional Indian culture. The thread is symbolically the prerequisite for obtaining knowledge, especially spiritual knowledge. It is like

a “passport” for knowledge, linking the knowledge of the past and present with the educational future.

India's Heritage

India's cultural heritage is extraordinary. Dating back to the time of the Vedas, the knowledge covers a vast range of subjects from architecture to Ayurvedic medicine, *yoga* and philosophy, literature and drama, economics to applied sciences. India is often called the “land of origin” as the excerpt from the following poem expresses:

Origin

*What name is given to origin;
the first steps walked,
the first spoken thought,
the first written word,
the first fire?*

*So distant has the wind blown
from the land of first light.
To its land of origin,
the wind cannot return,
where all knowledge was revealed
and walked with holiness.*

To origin is given the name Bharat (Brown, K 2003)

It is this extraordinary knowledge from the ‘land of origin’ that needs to be preserved. This is expressed succinctly in the following words by Sri Prabhakar Keshav Sardeshmukh Maharaj: “Money does not last. Empires disappear. Nothing else but knowledge lasts eternally.”

Ultimately this heritage is part of the memory of the whole world. UNESCO has a well established “Memory of the World Register,”

<http://www.whc.unesco.org/nwhc/pages/home.pages/homepage.htm>

India’s potential to add to manuscript collections to this register is vast — and simultaneously the preservation needs are high.

Traditional Conservation Techniques

This conference highlights the importance of traditional techniques in preserving Indian cultural heritage. Using the analogy, they are like a strand in one of the sacred threads. These are techniques learnt from and based on nature. Examples in the area of preventative preservation include using leaves of the Neem tree to repel insects as well as red cloth and traditional chalk drawings (Perumal & Wheeler 1997). Traditional techniques such as these need to be gathered together and showcased to the world.

There is also the potential to work in collaboration with modern techniques; linking strands to achieve results that have even more far reaching implications. This concept is not new. There are parallels in a number of other fields. To give two brief examples: In the area of environmental research — traditional conservation practices in Karnataka are informing new biodiversity research (Gokhale 2004); while in the area of cancer research, the “Bharatiya Sanskriti Darshan Trust” is an example of successful collaboration between modern medicine and Āyurveda (BSDT 2005).

Similarly, the field is ripe as collaborative research is needed for its potential to integrate traditional conservation techniques

with “modern” approaches — especially in the area of preventative preservation. One of the more fruitful areas could be that of IPM (Integrated Pest Management).

Collaboration and Cooperation

All of these link with the trend for new alliances across the world. UNESCO’s *Memory of the World* program has as its foundation the concept that “we cannot do it alone,” especially the new field of digital preservation. With like-minded organizations like “Ausheritage,” there is good potential for collaboration and cooperation in the research of traditional techniques — and it would be heartening to see this as one of the outcomes of this conference. The protection of India’s intellectual property rights is another important strand — particularly in the area of Ayurvedic medicinal formulae and techniques.

Preservation, Conservation and Reformatting Roles

Along with conservation’s role in preserving the original or “artefact,” it is important to see the whole interconnected picture. Conservation techniques together with traditional techniques are a vital part of the overall preservation picture.

IFLA (the International Federation of Library Associations) has defined preservation as an interconnected thread of many strands: The term “includes all the managerial and financial considerations, including storage and accommodation provisions, staffing levels, policies, techniques and methods involved in preserving library and archival material and the information contained in them.”

IFLA Principles for the care and handling of library material

<<http://www.ifla.org/VI/4/news/pchlm.pdf>>

In comparison, IFLA's definition of conservation is of one specific strand of:

"Specific practices taken to slow the deterioration and prolong the life of an object by directly intervening in its physical and chemical make up. Examples would be repairing damaged bindings or de-acidifying paper." The role of conservation therefore is in preserving the original or the artefact through techniques such as stabilising, protecting, cleaning etc.

Along with conservation's role, it is important to see the other strands in the whole interconnected preservation thread. Especially significant is the complementary strand of reformatting or copying — microfilming, digitizing etc. This strand is of key importance when the originals are crumbling and turning to dust. The strand of preservation microfilming has the advantage of long life expectancy, while the strand of digitizing provides widespread access, but the thread is frail and needs constant replacement. Combining these two strands provides a new, more flexible, accessible and longer lasting hybrid thread. This hybrid approach also has parallels with the linking of traditional and modern conservation techniques.

The National Mission for Manuscripts

The National Mission for Manuscripts has a pivotal role in linking and coordinating the threads, in identifying what is available and systematically describing the manuscripts. In this work librarians play a key role in building databases, making connections and helping avoid duplication.

There is also a future need for "resource description" for "preservation metadata" — recording not only the existence of individual manuscripts, but also their physical condition and conservation treatments. This could also be linked to

existing surrogates — reformatted copies that have been microfilmed, digitized etc. This is a sphere ripe for further research and development and India has the potential to lead an IT revolution in this area.

The Next Stages

The next stages involve three key strands that are closely intertwined: cooperation, priorities and research.

Cooperation is needed to determine priorities at local, national and international level. For example, should the strategies be providing protective “enclosures” such as the red cloth covers, or conservation treatments akin to intensive first aid, or reformatting through microfilming and digitizing, or indeed a combination of all or some of these?

Research is also needed to test traditional techniques and link them with modern approaches such as integrated pest management. Collaboration with like-minded organizations can also assist in promoting the research through international literature. The work of Mr. Perumal is a classic example. It was through collaboration with Mr. Wheeler from the V&A Museum that Mr. Perumal’s work was published in a journal that has been widely circulated through the international preservation community.

All of these tasks are difficult; indeed they are of “Himalayan” proportions. Time is running out and the manuscripts are crumbling and turning to dust. The scale of preservation issues requires national and global cooperation, but in many cases human behaviour has not evolved to a level at which this cooperation would be possible. In the words of Abby Smith from the Council of Library and Information Resources (CLIR): “*Cooperation* is hard; *Coordination* is

divine.” (National Library of Australia, Web Archiving Conference, 2004.)

However, to return to the analogy, is not the thread, after all, the sacred thread — a passport for knowledge? India, as the “land of origin” has the potential: to coordinate and collaborate, nationally and internationally, to link the strands of the sacred thread from the traditional past, with the strands of the present, and join them in new collaborative and innovative ways so that knowledge is preserved for the future.

Origin

*What name is given to origin;
the first steps walked,
the first spoken thought,
the first written word,
the first fire?*

*So distant has the wind blown
from the land of first light.
To its land of origin,
the wind cannot return,
where all knowledge was revealed
and walked with holiness.
To origin is given the name Bharat.
To truth, teacher.
To all things, God.*

*So blow wind
until all knowledge is fulfilled
and stillness sits upon the Earth
and all walk with holiness
and eternity flows
in the river of silence.*

Interventions

Jyotindra Jain: In the last 25 years, one has noticed that the volume of cultural property in India on an average is diminishing. I find that museums are headless and no directors are appointed for years. Working within this field, when I hear of preservation and when I talk of preservation, my own words sound hollow. I hope one day we do a conference on that and address the real issue of how to deal with the mass of cultural property that we have and which we are losing with each passing day. It is the kind of administration that is more harmful than these insects and other factors of deterioration. I hope what I say will be heard.

S.C. Panda: Are you satisfied with what India has achieved in terms of work in the field of conservation?

Heather Brown: In India though there has been a lot of activity in the field of conservation of cultural property, not much is known of it outside of India. This is one of the issues of collaborative research. The first place of publication of your work should of course be within your own country, but I do beg you to share your work more widely. A lot of Indian studies are only reflected in Indian journals and not in international publications. We should perhaps disseminate more widely.

Maltesh Mottebennur: Is microfilming not outdated? Is it really helpful in comparison to digitization?

Heather Brown: That microfilming is outdated is one view. In my own professional view, the life expectancy of microfilm that has been produced to rigorous standards is estimated to about 500 years if it is stored correctly and it is this storage that might be a problem in India. The life of digital information is transient. Some debate the life of a CD to be ten years. To

compound things further, the software and hardware change in a matter of a few years. In my library and in other libraries in the world, the conservative solution is to microfilm, as the preservation base and digitize for access and then you get the best of both worlds. To read the microfilm, even in the future all one will need is a simple magnifying glass, while our great grandchildren may pick up a CD, that may have become obsolete by then, and question what that might be, and they may not be able to read it.

Ratna Basu: Do you think that dissemination of knowledge and acceptance of others' point of view and getting articles published in international journals is the only issue, when maybe the other publication has a political agenda of its own? It is not that it is not known what the other has done but the problem is the acceptance of the others' work.

Heather Brown: That is why we need collaboration and that is why I recommend like minded institutions and people to work together. What often blocks collaboration is simply politics. There will be friends and colleagues who are supportive. There are ways of collaborating and sharing. A lot of politics is simply jealousy. We must find ways around negative issues

A.S. Bisht: Technology is changing fast and so are practices, even though many Indian traditional means of conserving cultural property have remained the same. Have the indigenous techniques in Australia remained as they were or have they changed?

Heather Brown: That area still needs research. We are just beginning to understand the sophistication of our original people. Research has just started especially in Bush medicine and most of this is oral traditions. Some links of Bush medicine go back to Āyurveda.

P. Perumal: Many of us do work, but cannot write due to our language constraints. Due to collaboration with Mr. Wheeler, my work has been disseminated to the Western world.

Heather Brown: Your paper was so well presented that the National Library of Australia and IFLA approached the V&A for permission to reproduce it in the microfilming training materials and your paper has now gone all over the Asia Pacific region to Japan and elsewhere, and that is part of collaboration and dissemination.

Vipul Shah: When we talk of our manuscripts and knowledge in our manuscripts, we feel proud of our inheritance. When we think of preserving, however, we only think in terms of Western methods like digitization and microfilming. Why do we not simply apportion a small part of the budget and reproduce the manuscripts in the traditional manner and techniques. All these systems of microfilming and digitization are part of an unsustainable model.

With digitized material, anyone can access the matter. Knowledge should not go to anyone and everyone without any checks. Manuscripts should be utilized for the purpose they were created and not just frivolously. For example, manuscripts dealing with spiritual texts should be used as such, but people read them not with the intention of becoming pious but instead they use them for material gains.

Heather Brown: We need to look at priorities because as a preservation manager there are some items in my library that do not need extensive treatment. So we microfilm them to the highest standard and store the microfilm in the best possible conditions. We are digitizing without thinking of the other alternatives. Yes, access should be restricted.

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An Introduction to the Traditional Practices for the Control of Bio-Deterioration of Manuscripts

K.K. GUPTA

Abstract

Care of manuscripts was a major concern in the past and efforts were made to protect them from the different agents of deterioration. One of the most important of the deterioration agents was biological growth. India has a history of using herbs and other natural products effectively against the activity of bio-organisms. These products were apparently non-toxic to humans. The methods used to save the manuscripts were based on experience and knowledge of herbs and other natural materials and these practices were passed down to later generations. Gradually these practices went into oblivion in favour of modern and readymade materials. Most of the modern materials used today to counter insect attack are relatively drastic and toxic. It is therefore important to re-evaluate the traditional materials which are in use and to explore the possibility of using them with some modifications, if required. Conventional insecticides, at the same time, should not be too readily dismissed in favour of non-chemical methods as it is better to work with products which have a long history and for which a lot of information, particularly about

their advantages and disadvantages, is available. This paper deals with some traditional materials and practices that have the potential of being used for the protection of manuscripts from bio-deterioration.

Introduction

Care of manuscripts was a major concern in the past and efforts were made to protect them from various agents of deterioration. One of the most important of these deterioration agents was biological growth. The methods used to save manuscripts were based on experience and knowledge of herbs and other natural materials. These practices were passed down from generation to generation. With the advent of the Portuguese, British and French colonists in the Indian Subcontinent the traditional practices like using Neem leaves to protect crops and stored grains came to be regarded as backward and created a stigma. This led to the abandoning of these ecologically sound practices in favour of modern readymade chemical products imported from the west. Centuries of knowledge and wisdom accumulated in the minds of people based on the trials and errors of generations were threatened slowly but surely. Most of the modern materials used today are relatively drastic in action and toxic. Various methods are being used in different museums, archives and other manuscript repositories. These methods aim at killing the bio-deteriogens while some aim at deterring their growth or repelling them from their storage or display areas.

The materials used to combat the bio-deteriogens have their advantages and disadvantages. The toxicity of these materials to humans is one of the greatest disadvantages. Not only are they a potential health hazard for those who use them but the use of the right lethal dose for the insect is also very vital. Too heavy a dose would unnecessarily expose the

custodians and others concerned to toxicity, while too less a dose is not only ineffective but also increases the resistance of the bio-deteriogens against these chemicals. Lately, some methods such as creating an atmosphere of low oxygen, increased temperature as well as deep freezing have been developed. These, however, need special equipment and trained persons, and are rather expensive for a permanent use for large collections of manuscripts. Conventional insecticides however should not be too readily dismissed even in favour of non-chemical methods such as heat cold, gamma radiations as it is better to work with products that have a tested history and about which a lot of information as regards their advantages and disadvantages is available. It is important, however, to re-evaluate the traditional materials used and to explore the possibility of using them with some modifications to increase their efficacy, if required.

Summary of Practices for Preservation of Manuscripts

India has a history of using herbs and other natural products against the activity of bio-organisms, and these products were very effective and were apparently non-toxic to humans. Various practices were followed to preserve manuscripts from decay often in conjunction with natural products. Manuscripts were often stored in kitchen lofts, where smoke due to various materials used in cooking, kept the insects away. The storage boxes were made of hard wood with insect repellent properties. The manuscripts were wrapped in yellow or red cotton cloth. It is perhaps for this reason that red leather and cloth is common in India to wrap books and manuscripts. Combination of *Acorus calmus*, cumin, cloves, pepper, cinnamon and camphor was used as an insect repellent for six months, though it had to be replaced after six months or so. Peacock feathers and snake slough have often been found kept in old

books perhaps for their insect-repellent property. It was also a common practice to rub citronella oil on Palm-leaf manuscripts to increase flexibility and to deter attack by insects.

Turmeric has also been used as an insect repellent by rubbing its paste on the palm leaves, and by dyeing the binding cords and the cloth covers. Dried leaves from a neem tree were sometimes placed between the covers of the book to deter booklice. It has been believed that the insecticide present in the leaves is at its maximum potency at spring time, when the tree is in full flower and the leaves are of red colour. The Palm-leaf manuscripts are stored in closed wooden cupboards, with several sachets containing a variety of dried leaves and spices, such as neem leaves, sweet flag, cloves and pepper corns for keeping the insects away. The smoke produced on burning camphor oil has been found to be very effective as an insecticide and a fungicide. In southern India, leaves of *Vitex Negundo*, *nochi* are burned to repel mosquitoes from houses. Fumes of *ajvāin* obtained by its burning, has often been used as a fungicide and an antiseptic in Indian homes. *Havan* performed as a religious activity also has similar action, though more effective as a number of herbs is burnt in it. Dried tobacco leaves have been used in India to protect woollen clothes against insect attack. A mixture of camphor and clove has also been used to repel insects from textile and manuscripts collections. Smearing a mixture of mud and cow dung is still used to purify and sanitize areas. Colourful geometric designs known as *Raṅgolī* in Northern India and *Kolam* in the South are said to help keep insects away especially when red ochre is used in the colourful mixture. There are many more practices which either had been or are still used in different parts of the country, but because of the availability of ready made materials, lack of knowledge and of confidence in their long-term efficacy, they are dwindling away.



Fig. 3.1: Vitex Negundo

Fig. 3.2: Azadirachta Indica

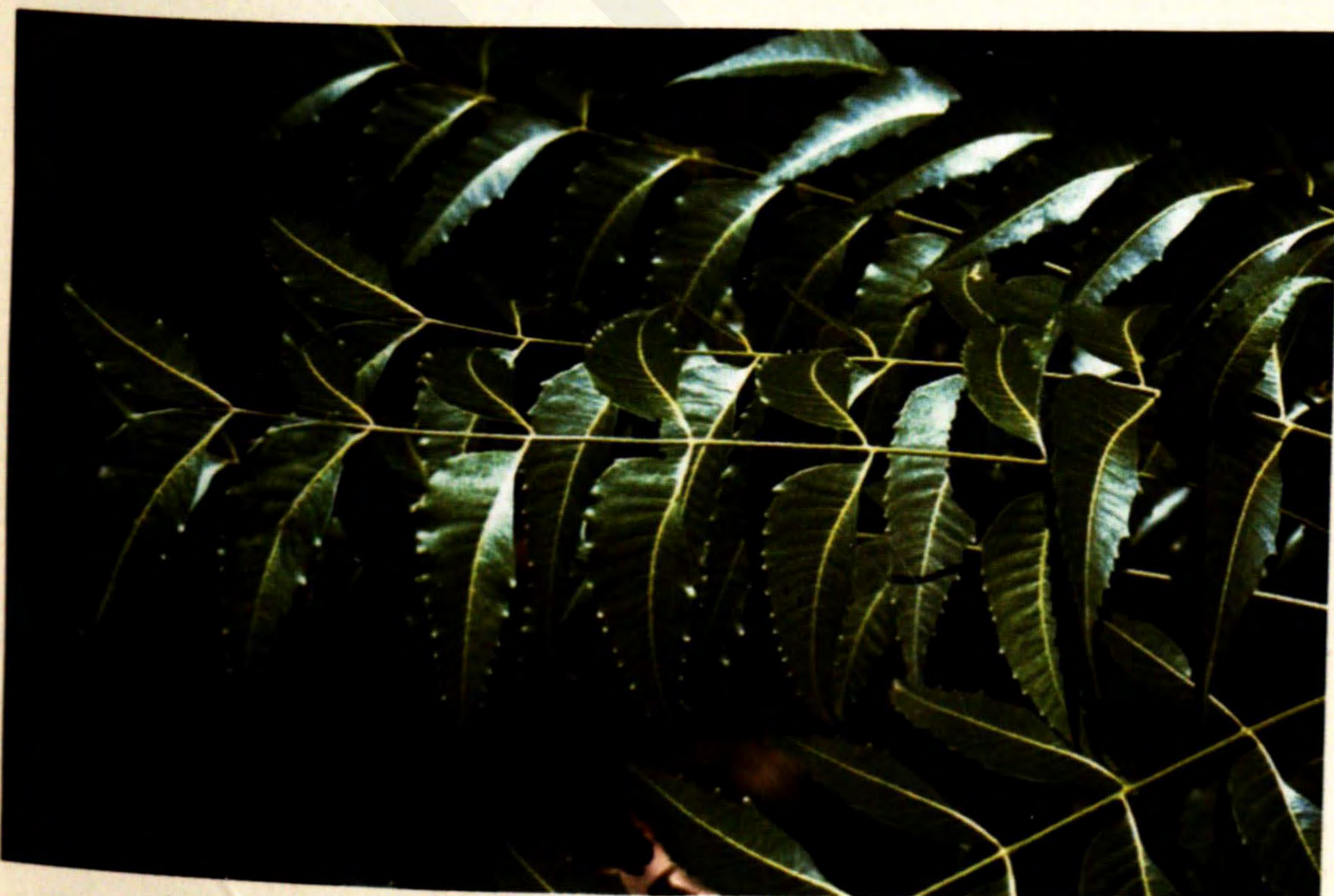




Fig. 3.3: Pyrethrum

Fig. 3.4: Nicotiana Tabacum





Fig. 3.5: *Cinnamomum Zeylanicum*

Fig. 3.6: *Acorus Calamus*





Fig. 3.7: Annona Squamosa



Fig. 3.8: *Allium Sativum*

Fig. 3.9: *Trachyspermum Ammi*





Fig. 3.10: Consolidida

Fig. 3.11: Piper Nigrum L.





Fig. 3.12: *Curcuma Longa* L.

Fig. 3.13: *Achillea Millefolium*





Fig. 3.14: *Mentha Arvensis*

Fig. 3.15: *Zingiber Officinale*



Action of Natural Insecticides and Insect-repellents

Many of the natural materials mainly of plant origin have the property of eradicating insects. Their main property responsible for this is the aroma they possess. The word "aromatherapy" means "treatment using scents." It refers to the use of essential oils that have aromatic essences extracted from plants, flowers, trees, fruit, bark, grasses and seeds, which enter the body by inhalation, absorption or consumption. The essential oils are complex mixtures of natural substances made by plants viz., ketones, terpenes, esters, alcohols, aldehydes and hundreds of other molecules. The essential oils' molecules are small and they penetrate the skin easily and enter the blood stream directly. A concentrate of essential oils is non greasy and evaporates quickly. The oils are used as pesticides either to repel or to kill certain insects. It is fairly common for two or more oils to be used in the same commercial product. However, some botanical pesticides can be quite toxic to humans, e.g. Methyl Salicylate (oil of wintergreen) which is commonly used as a food flavoring can be quite toxic in large doses.

These materials act as insecticides or insect repellents with various action mechanisms.

Vaporizers

Vaporizers are insect repellents used normally in the form of mats that are heated or lit electrically or otherwise to release an aroma. Essential oils are non-toxic insecticides with just two or three drops of the oil on a mat. Smoke from burning camphor helps to remove moths.

By definition, an insecticide is a substance that performs a biocidal action on insects due to the nature of its chemical structure. For example, if we kill an insect using a cyanide killing jar we can say that cyanide has an insecticidal effect.

However, we cannot say the same about water if it is used to kill the insect, since that mortality cannot be attributed to water's chemical structure or properties. Most plant species contain compounds that allow the plants to be used as insect deterrents rather than as insecticides. This means that in some way these compounds inhibit normal development in insects. This can be done in different ways which will be briefly described below.

Insect Growth Regulators

The growth regulator effect may be seen in several ways. Some compounds inhibit the proper metamorphosis of the insects. These may force the insect to go through an early metamorphosis, so that development takes place at a time not favorable for the insect. Some molecules have been observed to alter hormones related to metamorphosis so that insects suffer malformations and die.

Feeding Deterrents

Feeding deterrence is perhaps the most studied mode of action for plant derivatives used for insect pest management. Strictly speaking, a feeding deterrent is a compound that once probed by the insect, causes it to stop feeding and starve to death. Many compounds exhibiting this action are terpenes.

Repellents

The use of plants as repellents is an old practice and this has been done using compounds having bad odour or irritant effects, as is the case of garlic and hot peppers. Guatemalan and Costa Rican natives used to "paint" containers or sprinkle them with garlic powder before using them to store corn or beans to prevent the grain from being damaged by insects and also to keep away rodents.

Confusants

The presence of certain chemical compounds in plants is a sign for insects to find their food source. The monarch butterflies feed on plants that are highly poisonous and they locate them because of the presence of the poisonous compound. One way to use this characteristic in pest management is to set up traps by spraying them with infusions of certain plants that are more attractive to insects.

Resistance

Resistance is the ability of the insects to withstand an insecticide. Most insecticides of botanical origin are extracts containing a group of active ingredients of diverse chemical nature. From the point of view of resistance, the short residual life of plant insecticides may be considered as a positive attribute, since there will be a very low probability that two extracts would always be identical. Even if all the same compounds are found in the extract, concentrations almost always will be different. Generally speaking, insect resistance takes longer to develop to a mixture of natural active compounds than to any one individual component. This may be because it is more difficult to detoxify a compound complex than a single molecule.

Natural is not Always Non-poisonous

It would be a big mistake to consider products of plant origin including botanical insecticides, harmless merely because they are natural. There are a large number of plant products which are highly toxic. Ancient history mentions that Socrates was sentenced to death by making him drink a diluted extract of hemlock. There are a number of plants containing substances that are toxic to humans, including plants as common as almond

trees, some bean species, garlic, strawberries and apples, among others. We must therefore not forget that the toxic potential of a molecule is the nature of its chemical structure and not its origin.

Advantages and Disadvantages of Botanical Insecticides

Advantages

- Most of these plants, the botanical insecticides, are known by the common farmer
- Often these plants also have other uses, like medicinal applications
- Many of these products act very quickly, inhibiting insect feeding
- Most of these compounds are not toxic to human beings
- Most of these compounds are not very expensive
- Resistance to these compounds is not developed as quickly as with synthetic insecticides
- They generally do not require special equipments and precautions

Disadvantages

- Most of these products are not truly insecticides since many are merely insect deterrents and their effect is slow
- They are rapidly degraded by UV light so that their residual action is short
- Not all plant insecticides are less toxic than the synthetic ones

- They are not necessarily available throughout the year
- Most of them have no established residue tolerances

The Properties of an Ideal Insecticidal Plant

- It should be a perennial plant
- It should have a wide distribution and be present in large numbers in nature
- The plant parts, the leaves, flowers or fruits, to be used should be removable
- Harvesting should not mean destruction of the plant and that would mean avoiding the use of roots and the bark
- The plants should require small space, reduced management and little water and fertilization
- The plant should have additional uses (for example medicinal use)
- The active ingredient should be effective at low rates

Natural Materials with Potential to be Used for Heritage Preservation

Some substances in the plants and the animals are chemical substances, which are not directly beneficial for their growth and development but are the parts of their defense systems against certain damaging insects or bacteria. Since they have the required properties, such plant and animal products could be used as external insecticides or insect-repellents. Some of the natural materials that have the potential of being developed into useful products for protecting manuscripts from bio deterioration are listed below.

Neem

The neem tree (*Azadirachta indica*) is regarded as one of Mother Nature's gift to the world. In India, it is commonly found in house compounds in both villages and cities. Sushruta, the Indian scholar, in the fifth century BC recommended it as a "*kṛmihara*," an agent effective against insects. In the times when the Vedas were composed the Neem was called the *Sarva Roga Nivārīṇī*, one that could cure all ailments and ills, and is still regarded as such. The Neem tree originated in India, but about 200 years ago when ships began travelling the world, the tree was carried to all parts of the globe. So today we have several varieties of Neem trees, such as Indonesian, African, Mauritian, Burmese, Philippine etc as well as the original Indian. As a pesticide, the oil from neem seeds is believed to break the life cycle of pests and deters them from feeding and/or hatching. Studies have shown that active compounds in the oil inhibited the secretion of hormones into the blood, inhibiting the moulting and reproductive function in insects. In Africa, Asia and Latin America, leaves of the neem tree (*Azadirachta indica*) are sometimes burnt, producing an unpleasant odour, or hung dried inside houses.

Neem oil is known to be active against over 400 insect pests. It is believed to be particularly active against chewing and sucking insects such as caterpillars and beetle larvae. Neem oil is extracted from the tropical Neem tree, *Azadirachta indica*, contains insecticidal properties that are composed of a complex mixture of biologically active compounds. The best known of these is *Azadirachtin*, its J form being most active against insects. Other active ingredients include *Nimbin*, *Nimbidin*, and *Salannin*. The greatest concentration of these ingredients is found in the kernel of its seed. Its various active ingredients act as repellents, feeding inhibitors, egg laying deterrents,

growth retardants and direct toxins. It is believed that because of a large variety of active ingredients, insects will have great difficulty developing immunity because if they become immune to one molecule, the others will have their effect. It may also be because it adversely affects the insect's hormone system. And so no insect will be able to become immune, because its hormone system is essential for every bodily function. Significantly, insects develop resistance in each subsequent generation, and as insects dosed with Neem cannot breed, there are no subsequent generations in which resistance can develop.

Neem is affective against insects in various ways, namely:

- disrupting or inhibiting development of eggs, larvae or pupae
- preventing the moulting of larvae
- repelling larvae and adults
- disrupting mating and sexual communication
- deterring females from laying eggs
- poisoning larvae and adults
- feeding deterrent
- blocking the ability to swallow by reducing the motility of the gut
- preventing metamorphosis, thus preventing insects from maturing into adults
- It has very low toxicity for mammals

Its active ingredients, however, biodegrade rapidly in sunlight.

Neem seed oil and leaf extracts have also been used for centuries to prevent fungal infections in the tropical regions where neem is found. Use of neem-based powder and neem smoke makes the area dry, and kills the fungus. Neem extracts are some of the most powerful antifungal plant extracts found in Indian pharmacopeias against certain fungi (Khanna and Chandra, 1972). It has been found that the compounds gedunin and nimbidol found in the neem leaf, control several fungi.

Pyrethrum

The pyrethrum plant, *Chrysanthemum Cinerariaefolium*, contains several active substances that are toxic to insects. Almost all its insecticidal activity lies in the flowers and comes from a mixture of six chemical constituents — *Pyrethrin I*, *Pyrethrin II*, *Cinerin I*, *Cinerin II*, *Jasmoline I* and *Jasmoline II* collectively called "*Pyrethrins*." *Pyrethrins*, which are esters with insecticidal properties, act both on the central nervous system and in the peripheral nervous system causing repetitive discharges, followed by convulsions, paralysis and death. The active material can be extracted with a solvent from the dried flowers and stems. Dried pyrethrum flowers, ground to a powder, or the extract obtained from them, are used to produce insect-repellent sticks and coils. The coil is placed on a suitable stand and the free end is lit. The most important characteristic of these compounds is their irritating effect, which causes the insect to stop feeding as soon as it encounters a treated surface. Pyrethrum acts as a contact poison with rapid knock down effect on a wide range of insect species. It disturbs the insects, forces them to move out of their hiding places. Its repellent action towards insects even in very low concentrations makes it very useful. It is one of the safest insecticides because of its low mammalian toxicity, and so causes no significant harm to human health. It is highly unstable in light, moisture and air.

Nicotine

Nicotine is an alkaloid obtained from some plants in the *Solanaceae* family, particularly tobacco, *Nicotiana tabacum*. This compound is not found free in the plant but in the form of *Maleates* and *Citrates*. Nicotine is prepared commercially by the steam distillation of tobacco waste in the presence of alkali. It is a colourless and odourless liquid that darkens and develops a disagreeable smell on exposure to air. Nicotine is essentially a non-persistent contact insecticide. Nicotine activity causes the production of new nerve impulses which cause convulsions and death. An important new class of insecticides, commonly known as neo-nicotinoids, is the synthetic copy or derivative of the nicotine structure. Sprays containing free Nicotine or Nicotine Sulphate are employed as contact poison.

Rotenone

Rotenone is a flavonoid extracted from the roots of two plants, *Derris spp.* and *Lonchocarpus spp.* Rotenone contains insecticidal constituents, collectively designated as *rotenoids*. It is a contact and ingestion compound, which acts as a repellent too. Its mode of action involves the inhibition of the electron transport at the mitochondrial level, thus inhibiting insect metabolism. Insects poisoned with Rotenone intoxication causes a drop in oxygen consumption, respiratory depression and ataxia leading to convulsions in the insects, and finally to paralysis and death by respiratory arrest. Rotenone is much more toxic than nicotine but has little effect on humans or other warm blooded animals. A recent research, however, has linked rotenone to nerve damage, and so the extracts derived from this plant are not necessarily very safe.

Cinnamon Bark (Cinnamomum zeylanicum) Madagascar, Darchini, Nagkesar

Cinnamon Bark oil is extremely strong antibacterial and antifungal in nature. The essential oil of cinnamon bark is dominated by the two *Phenylpropanoids* *Cinnamaldehyd* and *Eugenol*. Cinnamon Leaf oil is far less sensitizing than Cinnamon Bark oil, but is a powerful broad spectrum anti-infection and anti-fungal. The aroma is similar to a blend of cinnamon and clove (because of its high *Eugenol* content).

Sweet Flag

Sweet Flag, *Acorus Calamus* or *Ghodā Bac* is an uncommon but widespread semi-aquatic plant, having a branched and aromatic root or rhizome. Both the leaves and rhizome are psychoactive, due to the presence of *Asarones*. It is commonly known as sweet flag. The aromatic leaves used to be placed on the floors of medieval churches and houses as effective air-fresheners and insecticides. The Chinese also traditionally used it as an insecticide. Dried powder of the root has been used for getting rid of household pests.

Karañja

Seeds of *Karañja*, *Pongamia glabra*, contain bitter and dark coloured oil (*Pongamia oil*), which contains toxic flavonoids including *Karañjin* and *Pongamol* alkaloid. The oil possesses insecticidal and anti-bacterial properties because of the presence of alkaloids. Field trials of mixtures of neem (*Azadirchata indica*) and *Karañja* Oil (*pongammia glabra*), have shown excellent results against several families of pests.

Cassia

Cassia's chemical constituents should make it a powerful germ killer, and a possible dermal toxin, easily absorbed into the

skin. *Cassia*, *Cinnamomum cassia* and *Cinnamomum aromaticum* blend with citrus, wood and other spices.

Seetaphal

The leaves and seeds of Seetaphal, *Annona squamosa*, have very powerful insecticidal properties. The custard apple genus contains several tropical species that produce large, aromatic, sweet-tasting fruits; these include the Sweet-sop, the Soursop, and the Cherimoya.

Cedar Wood

Cedar trees belong to the pine family. The genus produces fragrant, durable, red-coloured wood. The *Deodār cedar*, *Deodār*, occurs in the Himalaya and is an important timber tree in India. The name "cedar" is also applied to other conifer trees with fragrant wood. Cedar wood oil is often used in mothproofing, and may contribute to the control of certain other insects. Cedar works best in confined spaces such as clothes storage bins, but had little effect in other applications.

Because of its insect-repellent aroma, this has been used for making cloth chests. It is also excellent for preparing insecticide blends.

Citronella

Oil of Citronella is volatile, liquid oil derived from dried cultivated grasses. Oil from the citronella plant is widely used as a repellent. Industrially produced citronella is an active ingredient in some commercial repellents. Citronella is about as effective in repelling some insects as the chemical repellents, but its effect lasts for only about an hour. Citronella oil is an insect-repellent but its effect is very brief. It is sometimes prolonged by mixing the volatile repellent with animal fat or

oil to reduce the rate of evaporation. Citronella oil is not expected to cause harm to humans, pets or the environment.

Garlic

While Garlic oil, *Allium sativum ophiascordon*, *Ampeloprasum*, *Sativum sativum*, is not exactly considered an essential oil by purists, but it has been considered an organic pesticide for some time. Garlic exhibits antibacterial, antifungal and insecticidal qualities. Garlic oils kill pest insects. When it is combined with oil, it becomes a very effective insecticide. Some studies also suggest that a garlic oil spray also has fungicidal properties. Good results have been seen with a garlic and neem oil combination against insects.

Clove

Clove, *Syzgium Aromaticum*, is a tropical tree of the *Myrtaceae* family, and is an aromatic material. The oil is obtained from cloves by repeated distillation.

Ajvāin

The essential oil of *ajvāin*, *Trachyspermum ammi* is dominated by thymol, though α -pinene, p-cymene, limonene and γ -terpinene, have also been found. It is known as Carum, Ajowan also.

Myrrh

Myrrh, *Commiphora myrrha*, an aromatic gum resin, is obtained from a tree in Africa and Arabia. Myrrh consists of a mixture of resin, gum, and the essential oil myrrhol, which produces the characteristic odour. It has a bitter and pungent taste. The gum resin is used today as an antiseptic in mouthwashes and toothpastes.

Costus

Costus, *Saussurea lappa*, is known locally as Kuṭh or Kuṣṭ. The root of the plant *Costus* contains the alkaloid *Saussurine*. According to Sir R.N. Chopra, the roots of *Costus* were used to protect woolen fabrics from insects. *Costus* is an herbaceous plant, grows in Himachal Pradesh, and yield an essential oil on steam distillation and *resenoids* when extracted with solvents.

Sandal Wood

True sandalwood, *Santalum album* is a tree widely cultivated in southern India and is locally known as *Chandan*. The articles kept in boxes made of sandalwood are not affected by insects. It has been found to contain a compound which has pronounced hormone activity, disturbing the physiological process of developing insect larvae. Sandal wood dust is commonly used as an insect repellent. The dust is traditionally kept in cupboards used for storage of textiles etc. It also acts as a humidity buffer.

Nirgaṇḍī

Nirgaṇḍī, *Vitex Negundo*, is a shrub found almost throughout India. After being dried in sun, the leaves of the shrub are inserted between the bundles of Palm-leaf manuscripts to keep the insects away.

Vetiver Zizanoides Linn

Locally known as *Khus*, this is a densely tufted perennial grass with branching roots. It is found almost in all parts of the country. Its roots and oil are both used as insect repellents.

Sabadilla

This is a compound that can be obtained from seeds of a plant known as *Schoenocaulon officinale* (*Liliaceae*). Seeds of this plant have been shown to have high concentrations of alkaloids which impart its toxic properties. The mode of action is disruption of neuron cell membranes causing reduction of nerve activity, paralysis and death. The ground seeds are one of the plant insecticides with the lowest mammal toxicity, but that is not the case with their isolated alkaloids which are both highly toxic.

Larkspur

Larkspur, *Sonolida*, is an anti-parasitical, insecticidal plant, some species of which contain poisonous alkaloids such as *Aconitine*. Delphiniums are also called *larkspurs*, but the true *larkspur* belongs to another, related genus.

Black Pepper

Black pepper, *Piper nigrum* L, known as *Gol Mirchī* or *Gulkī*, contains about 3% essential oil, whose aroma is dominated by *Monoterpenes hydrocarbons*. *Sesquiterpenes* make up about 20% of the essential oil. *Phenylether* are found in traces. Higher terpenes are less volatile and therefore of less importance. Loss of monoterpenes due to bad storage conditions makes it less effective. The most important odorants organoleptically in black pepper are *linalool*, *α-phellandrene*, *limonene*, *myrcene* and *α-pinene*. The musty flavour of old pepper is attributed to the formation of heterocyclic compounds (*2-isopropyl-3-methoxypyrazine*, *2,-3-diethyl-5-methylpyrazine*).

Canola Oil

Canola oil is an edible vegetable oil obtained from the seeds of two species of rape plants, *Brassica napus* and *B. campestris*

of the family *Cruciferae* (mustard family). It is used to control insects. Canola oil is considered safe for human consumption. Canola oil repels insects by acting as an insect irritant. Canola oil appears to have no adverse effects on humans or the environment.

Catnip Oil

Nepatalactone, the essential oil in catnip, can be used as a very effective mosquito repellent. The researchers believe that catnip repels mosquitoes by an irritant reaction.

Cottonseed Oil

Cottonseed oil is generally considered the most insecticidal of the vegetable oils. Several commercial products are available that contain cottonseed oil; however this oil is not generally available for widespread use.

Peacock Feathers

While the feathers are attached to a peacock, they leave aromatic accretions, which spread throughout their feathers. When the feathers are detached, the residual aroma acts as insect repellent. The feathers therefore have been found placed within old books for this insect repellent property.

Turmeric

Turmeric, *Curcuma longa* L, is known as *Haldī*. It is an erect, perennial herb, of the ginger family. Turmeric contains an essential oil, which contains a variety of *sesquiterpenes*, many of which are specific for the species. Most important for the aroma are *turmerone* (max. 30%), *arturmerone* (25%) and *zingiberene* (25%). It is found in many parts of India. It has been a common practice to rub a paste made from turmeric into palm leaves that imparts to it a slight yellow colour, but

endows it with an insect repellent nature. The active principal is alkaloid.

Snake Slough

Snake Slough is charged with an aroma liberated by the male snake probably to entice the female, while it is on the body. Normally it gets rid of the slough after the end of the mating season. The slough is collected from the bushes and trees. Pieces have been found kept in old books, perhaps because of their residual inset-repellent aroma.

Black Cumin

Black cumin, *Nigella Sativa* Linn, is cultivated in many parts of India where it is known as *Kālā Jirā* or *Mungrelā*. The seeds are stated to contain 0.5 % to 1.4% of an essential oil and a saponin like glucoside, melanthin. It was a common practice to scatter the seeds between the folds of linen and woolen clothes to protect them from insects. Sometimes the seeds were mixed with camphor powder and sprinkled between the folds of textiles

Microbial Insecticides

Microbial insecticides are products containing microorganisms or their byproducts that result in insect diseases. Like botanical insecticides, they are of natural origin and have similar advantages and disadvantages. However, unlike botanicals, microbials have no effect on mammals. In fact, any given microbial will kill only a very limited group of insects.

Bacillus Thuringiensis

Bacillus Thuringiensis (BT) is probably the most common microbial “active ingredient.” It is a naturally occurring, soil

borne organism that paralyzes and destroys the stomach cells of insects that consume it, especially larvae of flies and moths. At present BT is the only “microbial insecticide” in widespread use for insect control. Bacterial agents, however, are effective in controlling insects in the larvae stage only, and because of the very selective nature of microbial insecticides, users must know what pest they want to target, and ensure a proper selection.

Ryania

Ryania is a stomach poison, which will cause an insect to undergo a long period of inactivity before its death. Its residual period is longer than other botanicals. More attention has been given to this insecticide in recent years.

Catnip

Catnip deters flea beetles, aphids, Japanese beetles, squash bugs, ants and weevils. It repels mice quite well. Sprigs of mint spread around the house deter mice and ants.

Wormwood

It is an excellent deterrent to most insects. The two best varieties for making insect spray are Silver King and Powis Castle. Silver Mound is great as a border plant and is the most toxic wormwood.

Yarrow

Yarrow, *Achillea millifolium*, has insect repelling qualities and is an excellent natural fertilizer. A handful of yarrow leaves added to the compost pile really speeds up the reactions. It may increase the essential oil content of herbs when planted among them.

Mint

Mint, *Mentha Arvensi* is commonly known as *Pudinā*. In its natural form the mint plant leaves are used to repel cockroaches. *Transpulegol* is said to be the active principal causing irritation to ants and cockroaches.

Red Squill

It is obtained from the bulbs of red variety of *Urginnea Maritime*, a native Mediterranean species. Used against rodents from ancient times, the toxic substance, a glucocide, has little effect on human beings.

Ginger

In China, *Zingiber officinale Roscoe*, ginger root and stem are used as pesticides against aphids and fungal spores. The characteristic aroma of ginger is due to a volatile oil present in a concentration of 1% to 3%. The volatile oil of ginger root was capable of inhibiting the growth of bacteria in a closed chamber,

Apart from the above mentioned materials, there are several other natural products of plant or animal origin, which are either being used in different parts of India, where they grow or have suitable properties for eradicating the insects or fungal infection. These include *Tulasī* (*Ocimum sanctum*), Basil (*Ocimum basilicum*), Capsicum (*Capsicum annuum*), Goldenseal (*Ydrastis canadensis L.*), Eucalyptus (*Eucaliptus globolus*), Laserwort (*Sapohsnikoba divaricata*), Myrobalan (*Phyllanthus emblica*), Palmarosa (*Cymbopogon martinii motia*), Saffron (*Crocus sativus L.*), and many other citrus and herbal oils. These natural materials have been found to be effective in many cases, but they also seem to have failed in some other cases. Since it has been observed that their efficacy significantly

increases by introducing some surfactant, preparing their mixtures and by adding some synthetic chemicals, these need to be re-evaluated preparing new recipes accordingly.

Conclusion

Though natural materials from plant and animal origin are not always sufficient to eradicate insects and fungal growth, they should not be dismissed in favour of other synthetic materials. Efforts instead should be made to exploit their relatively non-toxic characteristics and ability to resist the development of resistance, by addition of some other non-toxic material or using their mixtures.

Interventions

Jyotindra Jain: I am wondering that when insects get used to certain types of synthetic insecticides, why would they not get used to the natural insect repellents? In my farm I noticed that the Neem trees were eaten up by white ants and since then I have begun to question the efficacy of our traditional systems.

K.K. Gupta: There is a need for research even for those systems of ours that have been used for centuries.

Vipul Shah: When we evaluate our traditional systems, we evaluate from modern parameters. Why can we not go to the original thought behind the system? For example, when we undertake a fast in India, we do it for the development of our soul, our *ātman*. When someone says that the fast is good for health, then we are evaluating it from a much lower level.

When preserving the manuscripts using a scientific approach and attitude, we forget that the basic thing is about maintaining the purity of the *grantha*, the *cetanā* of the *grantha*.

The manuscript has been created by someone who has written it with purity of mind and body and with reverence. This same manuscript is being treated by us using cheap chemicals not considered *pavitra* or spiritually pure in any way. The *prāṇa*, life force of the manuscript should be kept alive. Let us not evaluate things only from modern parameters.

Why understand water only as H_2O ? Scientifically all the waters will be of the composition H_2O , yet the quality of river water is different from that of rain water which in turn is different from tap water or bottled water. Therefore I believe we are doing injustice by evaluating and certifying traditional systems by modern parameters.

K.K. Gupta: Traditional systems are not always so effective. There is need to modify them a bit if necessary.

V. Jeyaraj: When the anti-insect ingredients present in natural products evaporate, they are prone to attack. When the seeds or leaves are used instead of the synthetic chemical, they may serve the same purpose of preserving our materials. Therefore we should use what can be available. Use traditional and synthetic products alternately if necessary.

T.C. Saikia: What natural products can tackle fungus?

K.K. Gupta: Smoke of neem and *sat-ajvāin*.

Maltesh Mottebenur: Is there any method to tackle rodents?

K.K. Gupta: Rotenone is used for repelling mice and rats.

A.S. Bisht: In conservation and in this Mission of preserving the manuscripts, there is no one-time treatment. Manuscripts need continuous care and watch. Most of the damage happens in the store because of not keeping it in order. More than the insects and light and climate it is we and only we who are responsible for damage suffered by our collections. We often

do not do our duty as we are supposed to do. We should have collective responsibility to keep our documentary heritage in a good state of preservation.

To control the proliferation of insects there was once propagated the application of radiological control. Gamma rays were bombarded on the manuscripts. The insects then could not multiply. What we do is use available technology. We must manage with what we have. Insects are after all living creatures and we should create an environment by which insects eat something else instead of our manuscripts. It is therefore all about preventive conservation. We must use knowledge properly with our head and our heart. We must not unduly just keep searching and researching over and over again.

Saroja Bhate: There are advantages and disadvantages of using traditional as well as modern materials and technology. We need to study those cases especially where traditional methods and systems have failed. Though I am not a champion of traditional systems, I must relate that we have cases where traditional methods have been used successfully to preserve collections as at the Bhandarkar Institute in Pune. For the last 70 years the collection is in a good state of preservation.

K.K. Gupta: Yes, we need to see both the advantages and disadvantages very critically.

Shreenand L. Bapat: The climate of Pune too helped to keep the manuscripts in a good condition. The efforts of the workers and the custodians of the collection, cannot be ignored either.

Indigenous Conservation Practices for Palm-leaf Manuscripts in India

C.N.K. ALAHAKOON

Abstract

In Sri Lanka the art of writing has been in existence since the fifth century BC. The prolific use of Palm-leaf manuscripts and their production helped education to flourish and libraries to be established in Sri Lanka. A strong awareness of conservation of manuscripts along with their proper preparation and care was built up by the clergy as well as by the students, and because of this, traditional organic written records from the thirteenth century are still present in a relatively good condition. This paper discusses the different indigenous methods and materials that were applied during the preparation and conservation of Palm-leaf manuscripts in Sri Lanka. Many of these methods are practiced even today.

Introduction

Every country has its own methods of preserving writings for a long period of time. In Sri Lanka though the art of writing has been in existence since the fifth century BC, the oldest Palm-leaf manuscript available today in Sri Lanka is the *Cullavagga* which belongs to the thirteenth century CE. Being organic in

nature, palm-leaves are susceptible to decay and disintegration over time. This may have happened due to lack of proper maintenance, unsuitable storage techniques and unsatisfactory environmental conditions. The Palm-leaf manuscripts serve as authentic and important primary sources of knowledge and information and should be preserved and conserved. While today there are numerous synthetic chemicals and pesticides manufactured that are used also for preservation and conservation of cultural property, it can be assumed that earlier the technical skills involved in the process of preparation of manuscripts has helped these manuscripts to last for more than seven centuries. The use of herbs and local techniques are not hazardous for humans and neither for the manuscripts' materials. At the same time, these methods do not need much expertise, tools, equipment and money. It is therefore the necessary starting point in this study to identify the indigenous methods that have been and are still used to preserve the Palm-leaf collections in various parts of the country.

Traditional Processing of Palm-leaves

Since ancient times the palm leaves have been prepared as a support to write on. Normally the best writing support is prepared from the unopened leaf bud of young palms. After the midribs are removed, these leaflets are coiled into loose rolls. These coils are then boiled in water for three to four hours, often with the addition of tender pineapple leaves (*Ananas comosus*),¹ raw papaya (*Carica papaya*) and its leaves,² leaves and fruits of *Beli* (*Aegle marmelos*), *keppetiya* leaves (*Crotolaria retusa*) or *Pinna* leaves (*Clerodendrum pholomidis*) or *Bombu* leaves (*Symplocos cordifolia*).³ To monitor the completion of the boiling process, some paddy is placed in the container before boiling and when the rice splits. When the pieces of papaya can be made into pulp easily with fingers or when the



Fig. 4.1: *Carica Papaya*

Fig. 4.2: *Alstonia Scholaris*





Fig. 4.3: *Cocos Nucifera*

keppetiya leaves come off the branches, the palm leaves are considered sufficiently boiled. The use of these leaves as additives is said to enhance the durability of the Palm-leaf in addition to "brightening" its colour. The rolls are then taken out and hung out in single strips in gentle sun for three days or more until dried and stiff, taking care not to expose them to the sun's full heat.

At this stage, the procedure adopted for processing the leaves is according to the needs of the library or the scribe. These dried leaves are then exposed to dew for two or three nights and the leaf turns supple, light in weight, strong and durable. If there is then no immediate demand or only occasional future demand, the strips are tidily rolled into big reels and put into a store, that could be a loft in the kitchen, for later completion of the process when required.⁴ This system is effective for prevention of insect attack on the Palm-leaves.

When required, the rolled leaves are taken out of the kitchen loft and smoothened and polished by repeatedly running them over a smooth surface of a wooden log which is a metre long piece of either the Areca nut palm (*Arca catechu*), Rukattana (*Alstonia scholaris*) or Gadumba (*Trema orientale*). A long pole of Walla wood (*Gyrinops walla*),⁵ often used as a mortar to pound spices in a pestle, is also be used for the purpose.

The next step is to assemble all the leaves as a bundle and then perforate them with a heated iron rod to pass the cord for tying the bundle. The leaves are then cut according to the required size. The edges of the palm-leaves which are tightly pressed together are singed with a hot iron rod to remove the irregularities of the leaf-edges. The end of this rod is sometimes wrapped with a bit of cotton rag soaked in coconut oil and set alight. The gentle flame singes the edges of the leaves and it is believed that this process prevents the

formation of mildew on the leaves and protects them from insect attack.

The Palm-leaf bundle covers are good quality wooden boards made of hard wood such as that of Ebony (*Diospyros ebenum* Koen), Gammalu (*Pterocarpus marsupium*), Iron wood (*Mesua ferrea*), Val Sapu (*Michelia nilagirica*), Milla (*Vitex altissima*), Jak (*Artocarpus integrifolia*),⁶ Teak (*Tectona grandis*), and Toon (*Cedrela Toona*)⁴ and there is mention also of Kenda wood (*Maccaranga peltata*) being used for preparing the covers. The bundle of leaves is pressed with these two flat wooden cover boards and tied with a cord. The material of the cord was unbleached cotton or the fibres of the Wild Hemp or *Niyanda* (*Sansevieria Zeylanica*). The boards prevent curling of the leaves at the edges and also protect them from chipping and abrasion. To prevent the cord from slipping through the cover, the cord is attached to a perforated old coin, a decorative bead, crystal, a carved piece of ebony or ironwood or engraved horn, ivory, silver, copper or brass disc that could sometimes be even of gold or studded with gems.

Writing on the Palm-leaf

The normal writing instrument used is a steel stylus, the *Panhinda*. The stylus is made to suit the work. Its shape, length, and weight are balanced to give the scribe the physical ease in plying the tool. Five distinct features of the *Panhinda* are (i) *chatra* or sunshade — the edge of this is a sharp blade or a fine saw for trimming the leaf or cutting it; (ii) *Patra* or leaf — this is a flat part, shaped like a leaf and is generally decorated; (iii) *Nāla* or tube is generally ribbed or beaded; (iv) *Gaṇḍa* or ball is always a smooth rounded part; (v) *Lekhanīya* or the writing point is always steel. These five distinct parts have fixed proportions according to a rule and for *chatra*, *patra*, *nāla*,

gaṇḍa and *lekhanīya*, the proportions of the dimensions are four, two, three, one and ten respectively; for the whole *panhinda*, the proportionate measure is twenty. Scribes often cut a notch in one thumbnail to form a lever for the stylus to move on.⁷

Traditional Inking Method

The writing on the Palm-leaf was always scratched with a stylus and the faintly visible letters need to be inked. This inking is done with lampblack. The lampblack is made by burning waste cotton or rag and mixing the ash with what is commonly known in Sri Lanka as resin oil. Most temples use this method to prevent cracking or splitting of the leaf due to dryness from age. This method is used in Sri Lanka and India.⁸ The cotton (*Gossypium herbaceum*) leaf is also sometimes burnt and the dust is mixed with resin and this thick mixture is applied gently with a piece of rag and then cleaned with a piece of cloth¹. Another method is to cut to pieces and burn the branch of the *Gadumba* tree (*Trema orientale*) after having removed its bark. The charcoal is sieved and this fine charcoal powder is then mixed with *Dummala* (Resin) oil. This black ink was rubbed over the incised leaf, then it was left to dry and after that the leaf surface was cleaned with powdered *Dahaiya*, rice bran, that removes the excess black ink off the leaf surface.⁵ Other than the rice bran or rags, after applying the mixture, sifted *Kurahan* (*Eleusine coracana*) is also used to wipe away the excess oil off the leaves. This helps to prevent the leaves from getting stuck.

Traditional Oiling Methods

From ancient times, a variety of oils have been applied on palm-leaves in Sri Lanka by the following methods.

- (i) The powdered charcoal of the *Gadumba* tree (*Trema Orientalis*) is mixed with boiled resin oil and Mee oil

(*Madhuca longifolia*) and applied on the leaf. Resin oil is distilled from the following mixture: 2/3 of resin dug out from fields and 1/3 of resinous roots such as Kekuna (*Canarium zeylanicum*) and Divul or Wood Apple (*Feronia limonia*).¹

- (ii) In some of the areas in the country especially in the central part of the island, this oil is prepared by mixing *Dummala* (resin) oil and *Kekuna* oil that is distilled from the seeds of *Canarium Zeylanicum*.
- (iii) Two varieties of fossilised roots are used for this purpose. The resins come from fossilised roots of plants which are dug out from paddy fields, river beds or swampy lands such as *Hul* (*Vateria Copallifera*) and *Dun* (*Doona Zeylanica*). The resin oil is effective to maintain the texture of the Palm-leaf in good condition and it also acts as an excellent preservative against attacks by insect pests.⁹
- (iv) There is another traditional formula for making oil for preservation of palm-leaves. It is a heavily guarded secret and not easily divulged. According to it, *Devadāru* (*Erytroxylum monogynum*) roots, *Divul* (*Limonica accidissima*) roots, *Goraka Maliyam*, a resin from the *Garcinia cambogia* tree, and distilled *Dummala* (resin) are mixed together to get an aromatic oil. This mixture is excellent for preventing the leaves from becoming brittle with age and the strong aroma keeps insects away.⁵
- (v) *Athdemata* (*Gmelina arborea*) roots and *Savendara* (*Vetiveria zizanioides*) roots are also used for the preparation of oil.

- (vi) In the absence of *Dummala* oil, *Dudu* oil (*Gelastus paniculatus*) is also used for oiling and inking the manuscripts. This oil is brown in colour. Sometimes when these two oils are not available, finely powdered plumbago is also applied by rubbing it using a piece of rag.¹⁰
- (vii) To avoid brittleness, splitting and loss of flexibility of the Palm-leaves, *Pāṅgirī*, Citronella oil is also used and it is known to have insect repellent properties.
- (viii) In the process of oil distillation, some people mix *Kekuna* oil (*Canarium Zeylanicum*) or *Dorana* oil (*Dipterocarpus glandulosus*) instead of resin oil.³

Traditional Oil Distillation Process

Two methods of oil distillation process have been used in Sri Lanka and are still practiced in the South Eastern province of the country. These two methods are:

- (i) Take two new clay pots of the same size. Bury one of them in the earth keeping the mouth of the pot a little bit above the ground. Half fill the second pot with resins that have been dug out from around the roots of certain trees. On the top of this layer, place pieces of *Agil* wood until the pot is almost full. Cover the mouth of the pot by using a *Pol Matulla* (*Cocos nucifera*) and turning this pot over, place it mouth to mouth over the buried one. Seal the rims of the two pots with clay before firing it. Firing is done by placing the firewood around the upper pot and setting it alight. When the resins are heated, they strain through the *Agil* wood and drops of the distilled resin fall into the buried pot. This resin oil is used to ink the manuscripts. This method of oil distillation is still practised in the

south-eastern Province especially in Anuradhapura district of Sri Lanka. Most of the indigenous medicine men and the other elderly manuscript scribes know only this most traditional method.

- (ii) The second method of this Palm-leaf ink making process is the one which we commonly know from the past. In this method a new clay pot is taken and a hole, one inch in diameter, is made three to four inches below the rim of the pot. A Bamboo (*Bambusa*) or Papaw (*Carica papaya*) stalk, ten inches long is fixed into the hole. The outer surface of the pot is thickly coated with cow dung and clay. *Hul* and *dun* resin is placed in the pot and then water is added in the ratio of 10:1 by weight. The quantity of *hul* taken is more than that of *dun*. It was customary to dig the fossilized roots on Wednesdays or Saturdays as these days were considered auspicious for this purpose. The mouth of the pot is covered with a coconut shell and a thick clay layer is applied to seal the air gaps. The pot is put on a hearth and heated over a strong flame. Resin oil drips out from the open end of the bamboo or papaw stalk. First, brown coloured oil is collected and after some time an oil that is greenish-black in colour comes out.

The use of these oils has been an effective method to preserve Palm-leaf manuscripts. The existence of the copy of the *Cullavagga* in the National Museum, Colombo and of the copy of the thirteenth-century *Vishuddhimagga* in the University of Peradeniya in an excellent state of preservation bear ample testimony to the effectiveness of this oiling technique. On the other hand, the monographs on paper of a later period have disintegrated and perished.

Traditional Storage Methods

Some of the traditional methods which have been adopted by the custodians of manuscripts and are still in practice are mentioned below.

- (i) If there is no immediate requirement of the processed Palm-leaf or only for an occasional future demand, the strips are tidily rolled into big reels and put into storage in kitchen lofts for later completion of the process. By this method the leaves can be preserved for a long time without being affected by insects, fungi or mildew.
- (ii) The bundle of leaves is placed between two stiff flat wooden boards. This prevents warping and physical damage to the leaves.
- (iii) The Palm-leaf bundles are kept in closed boxes or chests and never have they been found to be kept in open racks or shelves.
- (iv) Some of the repositories and private collectors keep branches of *Kohomba*, *Margosa* (*Azadirachta indica*) with the manuscripts and it acts as a very good insect repellent. Its use has been widely recognized since ancient times.
- (v) Leaves of the *Keppetiya* (*Croton retusa*) tree are dried in mild sunrays and kept along with the bundles of the manuscripts. This helps to protect the Palm-leaf manuscripts against any kind of insect attack.
- (vi) Dried *Savendara* (*Vetiveria zizanioides*) roots also protect the manuscripts from insect attack. Its sweet aroma acts by repelling insects.

- (vii) Fumigation has also been used to prevent damage from fungus and insects in early days in Sri Lanka. Few drops of *Kohomba*, *Margosa* (*Azadirachta indica*) oil is put on to a burning charcoal tray and the aromatic fumes are employed as an insecticide and fungicide.
- (viii) Another natural product is *Pāṅgirī* oil (Citronella oil) which is applied in the storage boxes and cupboards and is a good insect repellent.
- (ix) From time to time, the manuscripts are oiled using *Dummala* (resin oil) and the strong aroma prevents silver fish from attacking the folios.
- (x) Wrapping the manuscripts in decorative and coloured cloth protects them from dust, insects and humidity.
- (xi) When transporting a manuscript, a narrow cotton cushion with a strap is used to protect the manuscript from damage in transit.

Concluding Remarks

The above mentioned plants and their products — oils, seeds, powders etc. have been recognized and used since ancient times as insect repellents and as preservatives in Sri Lanka. Moreover, over centuries users in Sri Lanka have been very much concerned about the safe handling of the manuscripts. One author mentions:

Given an opportunity to examine an *Ola* [Palm-leaf] book, old or new, it is always advisable to be extremely careful when separating the leaves, which may be in a sound condition or might have been rendered brittle from lack of periodical oiling, so as not to injure [the leaves] by mishandling them.⁸

Though there are numerous synthetic chemicals used for the preservation and conservation of palm leaves today, we must also note that the traditional notions and methods of preservation of manuscripts covered all aspects of the material and these traditional methods helped to enhance the durability of palm-leaves for such a long time.

Interventions

T.C. Saikia: What is rice bran? How is it used?

C.N.K. Alahakoon: It is sprinkled on the inked manuscript folio and then wiped off with a cloth. It takes away the excess ink off the surface of the folio.

S. Mandal: It will be useful to have all botanical names of the local species mentioned in the presentation.

P. Perumal: Is there any ratio for making holes in the Palm-leaf manuscripts?

C.N.K. Alahakoon: The holes are made according to the size and according to the subject. For example, in *Jātaka* and in Buddhism commentaries, the holes are a little bigger. The holes are placed in the following manner: Fold in three parts and then in four parts. Two pairs of creases are formed. Perforate in between the creases.

Anupam Sah: One may also refer to Anand Kentish Coomarswamy's book, *Mediaeval Sinhalese Art*, in which he guides the perforation of the cord holes, as mentioned by Ms. C.N.K. Alahakoon, using the Sanskrit rule:

ayamena caturbhāgam, tribhāgam punareva ca ।

ubhayoh sūtra-madhyena, tathā kuryāt chidra-lakṣaṇam ॥

S. Mandal: Are we destroying fossils for the sake of these traditional resin distillation systems?

C.B. Patel: Many of the traditional systems are the same in India. What is the oldest Palm-leaf manuscript available in Sri Lanka?

C.N.K. Alahakoon: The thirteenth-century manuscript, the *Cullavagga*, is in the National Museum, Colombo.

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Traditional Method of Sāñcīpat Making and Preparation of Ink in Ancient Assam

BHUPEN GOSWAMEE

Abstract

Of all the various kinds of manuscripts, the Sāñcīpat variety is characteristic of Assam. This paper traces the production of the Sāñcīpat manuscripts and describes the process involved in its preparation. Inherent in the preparation of the manuscript is the secret of its longevity. This paper addresses aspects of the tree, the processing of the bark, the preparation of the ink and storage of the manuscript.

Sāñcīpat and its Antiquity

Sāñcī, pronounced as *Hāñsī* is the name of a tree commonly known in Assam as *Agaru* tree, and *pat* means the “Sheet(s)” for writing on. The *pat* are prepared from the bark of the tree. Based on the literary account¹ available in *Harṣacarita*, written by Bāṇa, it may be presumed that manuscripts were written

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1. It is stated in Bāṇa's *Harṣacarita* that Bhasarvarma, the king of Kāmarūpa (the ancient name of Assam) sent several presentations including a *sāñcīpat* to Harṣavardhana Śīlāditya, the king of Kannauja.

on *Sāñcīpat* in Assam as early as the seventh century CE, however no collections of this period have so far been recovered or reported from any part of the country. On the basis of the collections of *Sāñcīpat* manuscripts available in India, the antiquity of its use as a writing material goes back to CE 15-16. A *tāntrika* work, *Ārya Mañjuśrīkalpa*, also mentions the use of *Agro-vaikal* which means, bark of *Agaru* tree.

The *Agaru* Tree and its Uses

Sāñcīpat is prepared from the bark of the *Agaru* tree that belongs to the family of *Thymelaeaceae*. It is known as *Agar* in Hindi and Gujarati, *Aggalicandanam* in Tamil, *Agaru* in Telugu and *Agaru* in Assamese and Bengali, while its botanical name is *Aquilaria malacensis* Lamk. Previously it was known as *Aquilaria agallocha* Roxb. Description of this tree is found in the book *Flora of Assam* written by Kanjilal. The *Agaru* is a large evergreen tree with white flowers and grows in the areas of Karbi Anglong, Hojai, Lanka, Dakhin kol or South Kamrup of Assam and in some parts of Meghalaya and Tripura. It grows well in hilly regions. Unfortunately, the destruction of forests has minimized the growth of *Agaru* tree in the region. Some modern researchers have planted this particular species of tree in different places of Assam such as in the H.K. Baruah Regional Botanical Research Centre of Guwahati University which is the largest botanical garden of North East India.

Once the tree is 15-20 years old, it tends to get infected with fungus, and from that fungus infected wood an essential oil is obtained that is used in perfumery and medicine. The costliest cosmetics like *Atar* and *Agaru* scent are made of this oil. The Government of India is exporting a large quantity of *Agaru* trees from India to the Arab countries for preparing these valuable cosmetics. In case the *Agaru* tree is not infected

by fungus, no such aromatic oils can be obtained from it. The bark of the tree is used to prepare the *Sāñcīpat* manuscripts.

Preparation of Sāñcīpat

The *Agaru* bark cannot be used in its natural state for writing and painting, and therefore, to make it suitable for the purpose, it has to undergo a particular processing indigenous to Assam for centuries.

- Step 1** An *Agaru* tree of not less than 15-16 years of growth and with a minimum 30-35 inches of girth is selected for its bark, as the bark of immature trees is less thick and may easily be infested by insects.
- Step 2** The selected tree is measured about 4 feet above the ground and the bark around the trunk is marked and incised with a knife.
- Step 3** From above this incised portion the bark is removed in strips 6 to 18 feet long, and 3 to 27 inches in breadth as required. The strips are removed off the trunk in an upward motion. The bark below the 4 feet mark around the trunk is not removed as this portion is very much uneven and not suitable for writing.
- Step 4** These strips are rolled up separately with the inner white part of the bark outwards, and the outer green part inside.
- Step 5** The rolled strips are dried in the sun for some days until they dry up well.
- Step 6** When these have dried, the bark is cut into pieces of convenient sizes, normally 9 to 27 inches long and 3 to 18 inches broad or of any other size as needed.

- Step 7** The pieces are then immersed in water at least for three days.
- Step 8** After three days these are again dried well in the sun.
- Step 9** Thereafter, the bark is boiled in water in a big iron pan to extract the alkali and to kill any worms and insects if they may be present.
- Step 10** Once the boiled pieces have been cooled, the hard green outer layer of the bark becomes soft and easily separable.
- Step 11** The outer layer is removed carefully and the surface is scraped smooth with a knife.
- Step 12** These are then dried again in the sun at least for half an hour, and when perfectly dry, rubbed with a piece of burnt brick made of sand and potter's clay.
- Step 13** A paste prepared from *Matimah* (*Phascolus radiatus*) is then rubbed in.
- Step 14** The smooth bark is then dyed yellow by means of arsenic sulphide (*Haital*) and also by vermilion (*Hengul*).
- Step 15** The dyed bark is dried in the sun.
- Step 16** The bark strips are then rubbed again as smooth as marble.
- Step 17** The strips are now ready for use as a sheet to be written upon with a specific Assamese ink.

Preparation of Assamese Ink

The ink that was used in old Assamese manuscripts was made of peculiar ingredients available in Assam, the formula of which is known to men of the older school. The chief characteristic of Assamese ink is its ability to tenaciously stick on the glossy surface of the *Sāñcīpat*. Its durability has been proved in the old manuscripts where the ink has not faded though the folios have deteriorated. The basic ingredients of Assamese ink are *Kehraj* plant (*Verbesina prostrata*), unripe green *Silikha* or *Harītakī* (*Terminalia citrina*), cow urine, a piece of rusted iron heated in the fire, a phosphorent extract from large earthworms, dew drops and ash of cooking iron pot.

- Step 1** The *Kehraj* plant is taken out from the ground along with its roots, washed and its juice is extracted by grinding it manually. The extracted juice is kept in an earthen pot.
- Step 2** Green *Silikha* or *harītakī* is ground and its juice is also extracted and mixed with the juice of *Kehraj*. This attributes a specific colour and permanency.
- Step 3** Equal quantity of cow urine is mixed with the above juices.
- Step 4** This solution is heated in an iron pot. While heating, a large quantity of froth forms but gradually the froth subsides and the liquid turns thicker or denser.
- Step 5** A piece of rusted iron is heated on the fire until it becomes red hot and then it is plunged into the above solution. This makes the solution darker in colour.
- Step 6** This solution is then filtered with a cotton cloth to remove the unwanted elements.

Step 7 Two or three large earthworms (*Bonda kechu*) are taken out from the earth and a bit of salt is sprayed on them. A white bright liquid, which probably is phosphorus, seeps out of the earth worm. This phosphorent liquid is mixed with the already prepared ink in equal quantity. This will bring a special sheen and permanency to the ink.

Step 8 At this moment and later on too, the ink may turn quite dense. It becomes very important to dilute it with the addition of dew drops. These dew drops are collected in a specific manner.

Process of Collecting Dew Drops

Dew forms usually in the months from October to December. During these months dew is collected from the open fields by a specific method. A large sized, clean and starch-free cotton cloth is stretched flat with the help of four wooden or bamboo posts in an open field for the night. A piece of small, clean and round pebble is placed on the middle of the stretched cloth. A clean pot is placed on the ground beneath the pebble. In the morning, the pot will be full of clean water of the dew. This water is the equivalent of today's distilled water.

Step 9 If the ink is found to be light in colour, smooth ash of iron cooking pots may be mixed with it. Then of course, the ink is to be filtered again with the help of cotton cloth to remove the unwanted elements from the ashes.

Step 10 The ink is now ready to write with and it is stored in the *Mahīcuṅga*,² an inkpot made of bamboo.

2. *Mahīcuṅga*: *mahi* = ink; *chunga* = long pot.

Writing Instrument

Before the advent of modern pens, writing instruments were prepared from a fern that is known in Assamese as *Dhekiya*. This “fern pen” is very smooth and suitable for writing on *Sāñcīpat*. The “fern pen” is put inside the ink pot made of bamboo. To prevent the nib of the pen from becoming blunt by touching the bottom of the ink pot, a bunch of human hair is put inside the inkpot so that the nib of the pen may rest on this soft cushion.

In this way, *Sāñcīpat* and Assamese ink were prepared to write manuscripts in Assam.

Indigenous Conservation Methods

The process of *Sāñcīpat* making has in itself the elements of preventive conservation. Modern paper making processes use chemicals that add an inherent self destructive mechanism in the paper. On the other hand the destructive elements are removed from the *Sāñcīpat* during its very preparation. For example:

- Mature bark is taken as the immature bark is prone to insect attack
- The sun-drying process eliminates possible fungus growth
- Submerging the sheets in water after sun-drying makes the sheet long lasting
- Boiling the sheets involves the process of destroying the insect eggs, larvae and other unwanted elements
- The folios were coloured with *heṅgul* (red lead or minium) and *haital* (yellow arsenic). Use of *heṅgul-haital* makes the manuscript more attractive on the one hand

and prevents the manuscript from being attacked by worms and insects

- In the centre of the *Sāñcīpat* folios, a hole is made for the folios to be secured together with a cord so that no folio can be missed or lost. This hole is known as *Nābhirandhra*
- Two thicker folios, little bigger than the manuscript folios are used as covers at both the sides of the body of the manuscript. Wooden pieces are also used as covers. Manuscripts without wooden covers are kept in wooden boxes specifically made for the purpose
- The manuscripts are normally wrapped with red cloth. It is said that red colour is insect repellent. In the absence of red coloured cloth, white cotton cloth is dyed yellow with the juice of turmeric. Turmeric is known to have insect repellent properties. Skins of goat, deer and snake have also been used as manuscript covering materials. A small manuscript titled *Guṇamālā* by the Vaiṣṇava Saint Śaṅkaradeva is preserved in the Museum of Bengenati Satra of Majuli and it is protected with six ivory pieces
- In some places of Assam, the manuscripts are preserved above the bamboo made ceiling of the kitchen or in the cowshed
- Tobacco is also rubbed on the sides of the manuscripts. Green neem leaves are placed along with the manuscripts. Tobacco and neem leaves prevent insect attack

With the help of all these indigenous methods of conservation, manuscripts dating as far back as the fifteenth

century have been preserved in different repositories of Assam.

Acknowledgement

The author has deep reverence for Shri Buddhindranath Barpathak, the octogenarian from Majuli Island who still in this old age practices the art of making *Sāñcīpat* manuscripts and teaches this skill to others with the hope that this dying art form will survive. The oral descriptions and demonstration by Shri Barpathak have helped the author to write this article and the author records his appreciation of this sharing of knowledge.

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Sāñcīpat Tradition

A Study in the Majuli Island of Assam

UTPAL DAS

Abstract

Assam has a long history of art, culture and literature. The materials used in writing literature as a medium are unique and splendid. *Sāñcīpat*, *tulāpat*, Assamese ink and use of colours have immense historical value. Majuli — the largest river island of the world still has the legacy of making traditional *sāñcīpat* a dying art form based on which once upon a time Assamese literature bloomed into its full extent. Lack of public awareness and disinterest on the part of State Governments as well as owners of these historical documents, have been contributing to the great loss of this unique tradition of *sāñcīpat* making. The revival of this technique will certainly help Assam literally, culturally and socio-economically.

Introduction

ACCORDING to the noted historian Dr S.K. Bhuyan, "One of the vast means of conserving and transmitting Hindu civilization and culture was through *pothīs* or manuscripts, elucidated by the verbal comments and explanations of the learned . . . almost every Assamese family had in its possession a cluster of Assamese manuscripts. . . Sanskrit classics and commentaries

are also to be found in the libraries of Assamese families." As learning bloomed in this part of the world, it attracted scholars of other countries like, "Hiuen-Tsang, Kabīr, Śaṅkarācārya, Caitanya, Guru Nānak, and Guru Teg Bahādur, who visited Kāmarūpa to imbibe the culture of the country and to give the best they had to give." The translated version of Bāṇa's *Harṣacarita* by Cowell and Thomas (Chapter VII, p. 214) talks about the King Bhāskaravarman, the ruler of Kāmarūpa in the seventh century who presented "Volumes of five writings with leaves made from aloe (*agaru*) bark and of the hue of the ripe pink cucumber" to the friend Harṣavardhana of Kanauj.

The Past

Assam has a rich history of art, culture and literature. The *Caryāpada*, a form of songs/poetry related to the preachings of the Buddhist religion are the first instance of written literature found in Assam. These *Caryāpadas*, in Assamese language are believed to have been written between eighth and tenth century CE on *sāñcīpat*, a type of paper made out of bark of Sāñcī tree. In fourteenth century, a pre-Vaishnavite literary age could be traced after a dark period of about four centuries after *Caryāpada*. Hem Sarasvati's written works can be considered as the first systematically written literature of that age.

The Assamese literature from fourteenth century to the end of eighteenth century comprises of Vaishnavite literature and literature of the Ahom Age. Mahāpuruṣa Śrīmanta Śaṅkaradeva's works namely *Kīrtana*, *Daśama*, *Rāma-vijaya*, *Pārijātā-haraṇa*, *Patnī-prasāda*, *Kāliya-damana*, *Keḷi Gopāla*, *Rukmiṇī-haraṇa*, *Haricandra-upākhyāna*, *Bhakti-pradīpa*, *Ajāmlar-upākhyāna*, *Balichalana*, *Guṇamālā*, *Bhakti-ratnākara*, *Nimi-Navasiddha-sambāda* are the biggest contribution to the Assamese

literature. The works were mostly on *sāñcīpat* and *tulāpat*. Sometime *Bhūrja-patra* and bamboo stretches were also seen in use. The literature in the Ahom Age is famous for the emergence of historical literature, i.e. *burañjīs* (chronicles). The *Purani Asomor Burañjī* is believed to be the oldest *burañjī* of Assam.

Though the practice of painting in ancient Assam is mentioned in *Harṣacarita* by Bāṇabhaṭṭa and in the account of Hiuen-Tsang early in the seventh century, however the golden era of painting in Assam was initiated by Śaṅkaradeva. The Satras or the Vaishnavite monasteries were the nerve centres of drawing and painting in ancient Assam. Śaṅkaradeva showed his extraordinary talent in illustrating the vision of seven heavens in the painting *Sāt Baikunṭha* on *tulāpat*, the paper made of cotton, for his drama *Chihnyatra Daśamaskandha Bhāgavata*, written by Śaṅkaradeva, which was found at Balisatra in Nagaon district is an excellent example of a vividly illustrated religious book. Paintings that are found on the pages of *Bhāgavata Purāṇa* show the artistic and skilful application of local colours. Colours like green, red, yellow and blue were used extensively. In some pictures, the four boundaries were decorated with the drawings of flowers and creepers; book containing such pictures are called *Latakata pothī* (creeper curved book). Some significant paintings are found in the book like, *Darrang Raaj Bangshavali* (genealogical details of the royal family of Darrang) compiled and painted by Suryakhori Doivagya in seventeenth century; *Hastividyārṇava* by Sukumar Borkath, *Śaṅkhacūrda-badh* by Kaviraj Chakravarty, *Gīta Govinda* and *Lava-Kushar Yuddha* by Harihar Bipra. According to Dr Maheswar Neog the pictures contained in the hand-written book *Kalki Purāṇa* authored by Ghanashyam Khargharia Phukan in the nineteenth century marks the end of the history of Assamese fine arts.

Nature of Ancient Writing Materials of Assam

We hereby see that various writing materials were used to write *pothīs* in Assam. The best way to understand how to care for or to preserve collections is to study the nature of the materials, their history, technology and manufacturing principles. But as the old literature on the history of writing materials is very rare, it becomes difficult to know the exact nature of manufacturing them.

From the eighth century *Caryāpada* to the early nineteenth century Ahom age literature, three types of paper materials were used in Assam. These are namely *sāñcīpat*, *tulāpat* and *Bhojpat* or *Bhūrja patra*. Sometime thinly sliced *bamboo stretches* were also used as leaf of book.

Sāñcīpat

Sāñcīpat is made from the bark of *sāñcī* or *agaru* tree or aloes woods (*Aquilaria agallocha*) which are processed through a tremendous laborious process of curing, seasoning and polishing the raw slices and conditioned with many things for dazzle and durability. The 9-27 inches long and 3 to 18 inches broad with 1 mm thick pieces are put into cold water for about an hour, and the alkali is extracted, after which they are dried in the sun for half an hour. When perfectly dry, they are rubbed with a piece of burnt brick. A paste prepared from *matimah* (*Phaseolus radiatus*) is rubbed on the bark and further dyed yellow by means of yellow arsenic orpiment (*haingul/haital*). This is again followed by sun drying, after which the strips are rubbed as smooth as marble to be ready for use. These processes were followed to enhance the ability of the leaves to retain the ink permanently. The centre of each leaf was perforated for the fastening string to pass through. Leaves thicker than those used in the body were used as

covers. These *pothīs* were very carefully preserved, wrapped up in pieces of cloth, enclosed in a wooden box, and were handed down as heirlooms from father to son.

Tulāpat

The *tulāpat* leaves were made by pressing cotton. Not much is known about the process of making this paper. The use of *tulāpat* increased from the middle of the Ahom Age. "They were used for inferior manuscripts, for letters, for private documents, and for official orders, for records of revenue grants, judicial trails, and dispatches," but, these does not mean that leaves of *tulāpat* were not long-lasting as we have seen records in *tulāpat* made 300 or 400 years ago are still in good condition.

Bhojpat

Bhojpat were a type of big leaf usually used as plates in feast, processed, dried and used as leaf of books. Uses of thinly sliced bamboo stretches as paper leaf were limited.

Assamese ink

The preparation of Assamese ink was peculiar in nature. The ingredients as well as the formula, are indigenous and known to men of the older school. The chief characteristics of Assamese ink are its durability and tenacity to glossy and slippery surface. The durability of the ink is such that though the folios of some manuscripts have crumbled due to insects or by humidity and dampness, the ink has not apparently faded. Importantly enough, the point of view of preservation is that there was a regular process of reviving faded script written by inferior ink, but with the passage of time, the technique has now become obsolete and forgotten. The Assamese ink was the product of the distillation of the extract

of *Terminalia citrina* (*silikha*) and the urine of bulls. The root of goose quill or reed was sharpened to use as pen for writing.

Dyes

In the paintings, yellow, green and red colours were prominently used. Occasionally, the use of blue colour is also seen. The formulae of colours have now been practically forgotten. The dyes of permanent nature, locally made from yellow orpiment (*haṅgul/haital*), indigo, carbon of earthen lamp, *Terminalia citrina* (*silikha*) extract, chalk (*khaḍīmāṭī*), egg yolk, the viscid substance of *Outenga* (a kind of acid fruit) seed and gum from tamarind tree.

The Present

With the advent of British in Assam, modern printing technology ushered in and thereafter writing materials such as paper and ink initiated in literature writing, which were mostly imported into Assam from outside.

Every old, well-known Assamese family still possesses a *varṁśāvalī* or genealogical history which are potential source of history, culture, lives and career of the bygone era. The study of Assamese manuscripts or *pothīs* provides an excellent opportunity to understand the evolution of Assamese language and scripts. Unfortunately the treasures hidden in Assamese manuscript have not yet been fully brought to light primarily due to numerous difficulties attached to the manuscript hunting process. The first individual attempt to collect Assamese manuscripts was made by Rev. Nathan Brown between the years 1840 and 1850. In his attempt, he could collect as many as 18 manuscripts of historical importance which were latter on deposited at the American Baptist Mission at Guwahati and finally to the Kamrup Anusandhan Samity during 1925.

Another individual attempt was made by Sir Edward Gait in 1895 and followed by some other sporadically. Though the effort of Sir Edward Gait was recorded in his *Progress of Historical Research in Assam*, published in 1895, the actual number of manuscript he collected is not known. The first serious and successful attempt to collect manuscript was in fact made by Paṇḍit Hemchandra Goswami between 1912 and 1914 when he was deputed for the purpose by Sir Archdale Earle, Chief Commissioner of Assam and Lt. Col. P.R.T. Gordon, the Hon. Provincial Director of Ethnography, Assam. Paṇḍit Goswami could collect as many as 233 manuscripts, of which 156 were in Assamese and 77 in Sanskrit which were subsequently handed over to the Kamrup Anusandhan Samity for preservation. Later on he compiled a descriptive catalogue of the same entitled, *Descriptive Catalogue of Assamese Manuscripts* (1930).

There are a few government repositories of manuscripts in Assam, namely, Kamrup Anusandhan Samity (1912) (presently Assam State Museum); Department of Historical and Antiquarian Studies (1928); Anundoram Borooah Institute of Language, Art and Culture (1990); Silchar Normal School (1908); and Krishna Kanta Handiqui Library of Gauhati University (1958). Besides, there are 665 *satras* (Vaishnavite monasteries) in entire Assam (along with innumerable numbers of personal libraries/collections) acting as repositories of *sāñcīpat* and other manuscripts. Be it governmental or non-governmental, it is seen that there is no coordination or sincere efforts in their activities as some are engaged either to a certain extent in manuscript collection or acting simply as store houses without proper preservation or some of them have stopped playing any role to fulfil their objectives set earlier.

It is observed in a simple survey conducted by me and one of my friends that the physical condition of *sāñcīpat* preserved in the above-mentioned repositories are deteriorating every passing day as virtually no scientific methods are in use with them barring one or two instances. The government officials who are engaged in these particular activities and are trained outside the State as sponsored candidates, either perform their responsibilities very lightly or face stiff negligence from the part of their higher authority, adding fuel to the fire of deterioration of manuscripts.

Like government-owned repositories, the existing 665 *satras* (Vaishnavite monasteries) in Assam where much of the original manuscripts written by Mahāpuruṣa Śaṅkaradeva, Mādhadeva and other Vaishnavite *gurus* are reposed, also stated to be the same in condition. The physical condition of manuscripts of private or family-owned collections are deplorable, as virtually nothing is being done for the treatment of age-old manuscripts owned as family heirloom.

Discontinuation of Sāñcīpat Making Tradition

From the seventh century CE to the nineteenth century, the entire Assamese literatures produced during these 1200 years was totally written on indigenously made *sāñcīpat* using naturally produced local ink. The literature produced during this period is the backbone of the Assamese identity, Assamese language and Assamese history, culture and heritage. But, it is a matter of great apprehension that once on which the entire literature of a nation or a race was written or existed is of no use today. Why so is it that an indigenous manuscript making technique has fallen to total disuse! To understand this, with the advice of Dr Anupam Sah, Coordinator (conservation), I did communicate with ten (10) persons of various sections of

the society of the Majuli island, asking four questions to all of them. Amongst the interviewee:

- Dr Pitambar Deva Goswami, Satradhikara or the Head of the Auniati Satra (Vaishnavite Monastery)
- Mr Budhindra Nath Barpathak of 85 years of age and is said to be the only living person who still holds the legacy of making *sāñcīpat* on his own effort in the Auniati Satra
- Two scholars from two Satras namely Auniati Satra and Uttar Kamalabari Satra
- Two lecturers from Majuli College
- Two students from the Majuli College
- one businessman, and
- one social worker

The Majuli island selected for this purpose was on the basis of three factors:

1. Out of 665 *satras*, as many as 33 *satras* (earlier there were 66 *satras* in Majuli) are in the Majuli island with the historically unique Auniati Satra which is the largest and said to be one of the oldest ones which attract hundreds of domestic tourist every year.
2. The 33 *satras* along with traditional households of Majuli island possesses more than 4,000 numbers of manuscripts written on *sāñcīpat* and *tulāpat* which are believed to be the original copies of literature produced during fifteenth century CE, which have immense literary, historical and religious value.
3. Most importantly, from the point of view of conservation, Majuli island holds the unique tradition

Lack of interest on the part of government, NGOs and also from the present generation is another factor that is contributing to the loss of the *sāñcīpat* making process.

Ignorance about *sāñcīpat* and the techniques of making it, is another factor for its deplorable state. Religious as well as social taboos are the main reasons behind this ignorance. *Sāñcīpat* and related activities were always under the control of a limited section of the society. The mass have never been allowed to participate in such activities.

Threats Before Majuli

The problem of Majuli island is multiple in nature. From the point of view of importance, both geologically and culturally, it is about to be declared as a world heritage site by UNESCO. The problem, the Majuli island is facing today is threatening its very existence. Every year, we are losing our cultural items in different forms. As per information available, almost 10,000 manuscripts have already been lost from the island in many natural disasters like flood, fire, etc. Worried by the situation, the Auniati Satra has opened its various branches at different places outside the Majuli apprehending possible shifting of its main base with all property, if any natural calamity strikes in future.

The largest river island of the world, Majuli is shrinking by a few meters every year due to erosion caused by the mighty river Brahmaputra. Majuli had originally an area of 1256 sq km (485 sq miles). But due to constant annual erosion, it has been reduced to only 929 sq km. It is feared that if preventive measures are not taken early, Majuli may disappear from the world geography along with the rich cultural heritage that developed many century back.

Like annual festivals, floods occur every year in the Majuli which cause enormous damage to lives and property. The remaining age-old cultural items such as *sāñcīpat*, rare documents, paintings, artefacts, stone and wooden sculpture of historical value are always in danger as many of them have already been washed out in the perennial flood.

Majuli is geographically cut-off from the mainland. Road, railway or airways, all three modes of communication are not available. Majuli is connected with the mainland only by ferry service; that too gets disrupted during monsoon due to heavy rain and flood.

The telecommunication services are also disrupting and not free from hazards. Majuli frequently remains cut-off from the mainland.

The inroads of IT in respect of microfilming, CD-Rom, digitalization, etc. of manuscripts are pressing need of the moment, but no institution including the government is coming forward to accomplish this task.

Thousands of local as well as foreign visitors including research scholars of various fields visit various *satras* in Majuli, yet, a well equipped guesthouse to attract foreign as well as domestic tourist; or a documentation centre for the research scholars; or a scientific archive for preservation of cultural and historical materials is not available in any *satra* on the Majuli island.

Satras need fund to run various traditional activities including preservation and conservation of *sāñcīpat* manuscripts, rare documents, paintings, artefact, stone and wooden sculpture of historical value along with running their *Toles* (schools). The collections of fund from visitors is not enough for various activities or to initiate a new venture on its own.

How these Problems could be Addressed

Summary of Responses

The government, various institutions related with the subject, NGOs and the public as well should come forward to save Majuli and its cultural heritage in whatever way they can.

Cultural, religious and educational conferences and meetings should be held regularly.

Ministers, influential persons and political leaders, scholars and learned persons should be invited regularly to make them aware of the situation.

Analysis of Responses

Looking at the vastness of problems facing Majuli today, anybody will be clueless as to how to address the pressing problems. I think, the existing 66 *satras* can do wonders for not only preservation and conservation of cultural materials but also for keeping age-old identity of the island intact.

Participation in various cultural programmes such as *Bhaona* (Vaishnavite drama), *Borgit* (Vaishnavite songs) outside Majuli and in various places of the country and inviting participation of others for the same inside the Majuli may help in bringing it in contact with national-level organizations, both government and NGOs.

Exhibition of cultural items, such as *sāñcīpat* literature, and making of *sāñcīpat*, at various book fair, trade fair, inside and outside the State, would make people understand the value of it.

Conducting academic conferences and seminars in Majuli relating to the ancient literature may attract academicians and scholars from inside and outside the State, in which might spreading the knowledge of *sāñcīpat*.

Government should declare all 665 *satras* as tourist sites (and place them in their websites to attract foreign tourist and scholars) without interfering the religious sentiments of the custodians. The Department of Tourism should come forward with various projects including guesthouse for foreign and domestic tourists and encouraging the locals in such ventures.

The Ministry of Culture should certainly come forward with minor projects like setting up small museums and documentation centres wherever possible to attract scholars from various fields.

How Sāñcīpat Making Process can be Revived in Assam

It is obvious that we cannot let the existing *sāñcīpat* manuscripts which have immense cultural, historical and literary value die in our hands. The death of *sāñcīpat* manuscripts mean the death of our literature, culture and history. The best way to care and preserve our *sāñcīpat* materials is to understand the importance and nature of it and revival of the *sāñcīpat* making techniques. The following interviews with the inhabitants of Majuli as mentioned above might throw some light on this vital aspect.

How the Sāñcīpat Makers of Majuli can Revive the Craft

Summary of Responses

- Setting up of schools or training centres at the *satras* to educate young generation regarding the rich value of *sāñcīpat* and techniques of manufacture
- Plantation of abundant *sāñcī* trees for easy availability
- A perennial source of fund is needed to run such ambitious programmes

Analysis of Responses

My observation suggests that ignorance about *sāñcīpat* as well as its production techniques may be treated as one of the main constraints of the present generation. Efforts have to be made to make the people aware of their culture, so that the present generation can come forward to revive the forgotten tradition of *sāñcīpat* making. To strengthen my point I would like to state the result of the simple bibliographic survey conducted by me recently on the topic "Literature on Traditional Manuscripts in Barak Valley of Assam since 1906," in three districts of Assam, namely Hailakandi, Cachar and Karimganj in southern Assam. I started bibliographic search from the year of 1906, as it is believed that consciousness of manuscripts in this valley started with the establishment of Silchar Normal School in 1906, where few scholars of this region started collecting *sāñcīpat* manuscripts to make Silchar Normal School a repository-cum-research centre of the same. The search of literature of 98 years (from 1906 to 2004) reveals an astonishing fact as tabulated below:

No. of Articles on MSS.	No. of Journals on MSS.	No. of Books on MSS.	No. of catalogues on MSS in Article form.	No. of catalogues on MSS in Book form.
16	NIL*	1	2	1

* The journal *Akhar Britta*, vol. 5 (1), 1995 was a special issue on *sāñcīpat* MSS.

The fact observed in the survey indicate that the study of manuscripts or the research activities related to the traditional manuscripts are as low as negligible. The situation in other parts of Assam seems to be no better. It only indicates the

poor knowledge level and lack of popularity of traditional manuscripts amongst the present generation.

Another observation is that the syllabus of the degree honours course of Assamese literature and Bengali literature offered respectively by Gauhati University and Assam University has a paper on ancient literature. As already stated, from seventh century CE to nineteenth century CE, these 1200 years of Assamese literature and tenth century CE to eighteenth century, these 800 years of Bengali literature are totally based on manuscripts. The paper on ancient literature in the degree course of the above-mentioned universities encompasses manuscript-based literature of the above periods. But it is really surprising to know that the honours students of the said paper are not acquainted with *sāñcīpat* manuscripts though they are studying manuscripts-based literature in that paper. Maximum numbers of students do not even know how *sāñcīpat* looks like! This is because there is no live demonstrations of *sāñcīpat* manuscripts in the classroom. As a result, students of literature remain ignorant and do not understand the value and importance of manuscripts and the origin of their own literature. So I would like to suggest:

- As educational institutions are the most effective organization in inculcating values among students, class room demonstration of *sāñcīpat* manuscripts, their making process, script and languages used in *sāñcīpat* may work wonders to the students of honours class of various fields, such as, literature, language, history, museology and tourism study. At least 15 marks relating to “various types of manuscripts” will surely enhance their knowledge on manuscripts interest in further research and study on the topic

- Department of culture should come forward with incentives/rewards/citation for outstanding research work in this dying art form
- Training centres or schools can be established in all 665 *satras* to train new generation on *sāñcīpat* making techniques and a collaborative tie-up of these centres with colleges and universities may yield better result in bringing consciousness and knowledge development
- A project on plantation of *sāñcī* or *agaru* tree or aloes wood (*Aquilaria agallocha*) can be initiated in all 665 Satras to become self dependent on *sāñcī* bark. Plantation of *sāñcī* tree also has environmental advantages which might prevent recurring erosion and flood at a place like Majuli
- Covering all the above aspects, the Department of Culture and Tourism may initiate a project at Majuli to train people on *sāñcīpat* making techniques along with other indigenously produced writing materials, so that the process of *sāñcīpat* making may be revived. In the training along with *sāñcīpat* making techniques, writing techniques of Assamese scripts on *sāñcīpat* may also be taught. The National Mission for Manuscripts, independently or in collaboration with UGC, may initiate a crash course on Assamese and other scripts written on *sāñcīpat*
- Such a kind of project is possible only when a perennial source of fund is available to the *satras*; as a model project, N.M.M. may come forward for initial funding, at least for initial few years
- The project should include not only making of *sāñcīpat*, but should also incorporate new ideas on *sāñcīpat*, other non-traditional market-viable products such as

greeting cards for all seasons and occasions, paintings on *sāñcīpat* using traditional colours, etc.

Improvement in the Quality of Life at Majuli Due to Revival of the Sāñcīpat Traditions

The summary of the responses received is as follows:

- *Sāñcīpat*, would be the media to spread Assamese *saṁskṛti* all over the world
- The efforts of Mahāpuruṣa Śrī Śrī Śaṅkaradeva and Śrī Śrī Mādhavadeva, undertaken 500 years ago, will yield result, as the world will come to know about them, their activities, literature, *satras* and of course about the Vaishnavite movement
- It may be a means of employment generation in the locality
- Economical benefit to the *satras* and to the business community, as well as various products of *sāñcīpat* origin and raw materials needed for *sāñcīpat* making may ultimately turn into a big market

Analysis of Responses

The revival of the old techniques of making *Sāñcīpat* may have enormous influence on the socio-economic conditions of Assam. Assam will not only be known as literally and culturally developed state, but soon would also be able to penetrate the national and international market with its eco-friendly natural products. The *satras* may soon turn up into financially self-dependent organizations; the socio-economic condition of the inhabitants in and around *satras* may rapidly change:

- One big advantage the *satras* have today is the typical mindset of much of the religious Assamese people.

The bulk of the Assamese people are religious in nature and they still do not prefer to perform their rituals with printed books. Religious books or books on rituals and rites of machine made paper are not allowed in many families even today. *Satras* can take advantage of this situation by producing literature on rites and rituals on *sāñcīpat* and let these out for marketing with the same respect and sanctity

- Many scholars and researcher want original works of Śaṅkaradeva and Mādhavadeva for their study and research purpose. *Satras* can develop multiple copies of such original works of Mahāpuruṣa on newly-made *sāñcīpat*
- Universities and colleges can use these newly-made *sāñcīpat* copies of original works for demonstration and research purpose
- They can be sold as children books with figures and portraits
- Traditional paintings using natural colours *haṅgul/ haital* can be developed for marketing
- Entrepreneurship may grow with the revival of *sāñcīpat* techniques. Production of greeting card using *sāñcīpat* with natural or combination of natural and artificial colours with traditional style of scripts may even have potential to penetrate into the billion dollar international market of greeting cards. The advantage of *sāñcīpat* origin greeting cards will be its natural look; eco-friendly, bio-degradable and everlasting quality — say 500 years! If properly channellized, the revival of *sāñcīpat* making techniques may have the potential to revive the socio-economic condition of Assam

Conclusion

The discussion cited above aims to receive attention from the scholars and those engaged in national duties in preservation and conservation of traditional manuscripts. Majuli being the epicentre of cultural heritage of Assam has the potential to survive on its own without much interference. Revival of *sāñcīpat* making techniques may bring new dimension into its life, socially and economically as well, which will ultimately help to preserve its rich cultural heritage.

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Scientific Analysis of Traditional Indigenous Methods of Manuscript Preservation

SUDHENDU MANDAL and SANJAY KUMAR MAITI

Abstract

From ancient times, India and her neighbouring countries have been a rich reservoir of varied forms of manuscripts. The diversity of the manuscript wealth of India is mainly governed by their geographical availability, cultural influence and religious background. In India, the basic ingredients of manuscripts were derived from nature and were mostly of plant origin. An in-depth study of the science of Manuscriptology will reveal the remarkable ingenuity and outstanding sense of preservation of our intellectual ancestors from the moment of manuscript preparation up to their storage. The present paper makes an investigative approach into the traditional Indian manuscript preservation techniques as practised in National Library, Kolkata and has analysed the effectiveness of the ancient trends in the light of modern science and their applicability in the present-day modern preservation systems.

Introduction

SINCE time immemorial man has succeeded in leaving behind the records of his activities for future generations. The

manuscripts are the hand-written records of man, which served as the vehicle of intellectual thoughts and ideas reflecting the knowledge and wisdom of our ancestors. Ancient rare manuscripts are a priceless treasure for any country to possess, and they are one of the most accurate sources to trace the cultural legacy of a nation. India and her neighbouring countries, from very ancient times, are the richest reservoir of varied forms of manuscripts. The literary heritage of India is very old and the various types of ancient manuscripts of our country serve a pivotal role in fostering the great literary heritage and religious culture of our country.

Diversity of Writing Materials in India

The great majority of the manuscripts collections, which constitute our precious national heritage on the Indological and oriental literatures are scattered in the temples, monasteries, Jain *granthabhāṇḍāras*, libraries, archives and even under the possession of individual private collectors. The diversity of writing materials is mainly governed by their geographical availability, stage of technological development, cultural influence and religious background.¹ India, from the very beginning was rich in her natural resources and the basic ingredients of the manuscripts were mostly derived from nature and were predominantly of plant origin.

In India as well as in the countries of South-East Asia which were enlightened by India's cultural influence, the bulk of manuscripts were produced on palm leaves before the advent of paper. Writing was made by incising and subsequent inking with lampblack on the leaves of thicker and shorter length of palmyra palm (*Borassus flabellifer* Linn. Fam. *Palmae*), as was the prevalent traditions of Orissa and south India, or it was written with ink on the thin, flexible, delicate, longer leaf of talipot

palm (*Corypha umbraculifera* Linn. Fam. *Palmae*) available mostly in western India and Bengal. Studies indicate that flexible talipot leaves have greater durability than leaves of palmyra palm. The Palm-leaf has a long tradition of use up to thirteenth century and later in various parts of India, whereas in south India this tradition prevailed up to nineteenth century having a lasting decisive influence. This governed the shape of the Indian manuscripts in "*punthi* format," which became the norm for most of the Indian manuscripts. Besides Palm-leaf, two types of important bark manuscripts flourished: (i) the inner bark of the Himalayan birch or *bhūrja-patra* (*Betula utilis* Linn. Fam. *Betulaceae*) which were abundant in Kashmir and north-western Himalayas mostly between the eleventh and sixteenth century. In the north-eastern states, especially in Assam, *sāñcīpat* or aloes (*agaru*) bark (*Aquilaria agallocha* Roxb. Fam. *Thymeleaceae*) manuscripts, better termed as *ahom punthis* were used from the sixth century.^{2,4} The birch bark is glossy reddish white in appearance with knot streaks, multilayered and joined by nature gum. While aloes bark is much tougher than birch bark, it has a thin, fibrous and even textured surface. With the introduction of paper following the Muslim conquest in India and subsequent manufacture, supply and use of indigenous papers from rags (tulot paper), hemp fibres, etc. since thirteenth century onwards there was a gradual decline in the existing manuscript tradition and a gradual switch-over to the paper-based manuscripts in *punthi* format. Besides these, manuscripts on cotton cloth containing charts, multi-coloured texts are also countered¹⁴ in western Indian libraries.⁵ Thus, the learned tradition of India was mostly preserved in the medium of Palm-leaf, birch bark, *sāñcīpat*, cotton cloth and indigenous paper-based manuscripts. However, various other writing materials like copper-plates for legal transactions were used elsewhere for durability and black cotton cloth (*koditam*)

impregnated with tamarind seed extracts were used for keeping accounts in Karnataka of south India.

Preservation Strategies Adopted in Earlier Days

The art of preservation is as old as human civilization itself. Our forefathers had judiciously selected the basic materials for writing from nature and were quite aware of the unsuitability of these organic materials in Indian tropical climate. Hence, they resorted to various means of processing, which they adopted through their time-tested experience, with great ingenuity for making those materials suitable for writing and imparting durability to them against various deteriorating agencies. Most of our traditional knowledge and experience were lost with passage of time, while some literary evidence gives us scope of rediscovering our valuable traditional experience.

Diversity in Processing Techniques as a Primary Step in Preservation

The preparation and processing of the writing materials often involved elaborate, laborious process requiring much time and patience. The processing techniques were of diverse types varying from place to place. In various parts of India particularly in Orissa, the flexibility of the palm leaves through seasoning was achieved by a number of ways like sun drying, burying in mud, sometimes exposure to kitchen smoke, drying in grain stores under paddy heaps or by boiling in hot water and subsequent application of turmeric (*Curcuma longa* Linn.) paste.^{6,7,8} Sometimes, the leaves were buried in damp sand followed by treatment with turmeric solution in sour boiled rice and finally polishing the leaves with a smooth stone or conch shell.⁹ The south Indian tradition was the application of gingili oil or *til tel* (*Seasamum indicum*) over the shade-dried

leaves for flexibility² besides other special types of processing. Curcumin, the chief constituent of turmeric imparted the colour to the manuscripts and the essential oil of turmeric is supposed to have insect-repellent properties. The birch bark sheets were made durable by moderate degree of processing. This was done by smearing it with oil and then polishing, so as to make it fit for writing.² The birch bark has been reported to be insect-resistant by its very nature, probably due to the presence of essential oils and methyl salicylate as a constituent.¹⁷ The aloes bark is aromatic in nature and is reported to be seasoned by alkaline treatment of the peeled bark with subsequent application of protective "*matimah* paste" (*Phaseolus radiate*). The bark was made insect-resistant by dyeing with orpiment (yellow arsenic sulphide; As_2S_3) and also by treatment in sulphur fumes. The indigenous paper-based manuscripts were generally of rough surface texture sized with yellow arsenic and an emulsion of tamarind seeds (*Tamarindus indica*) acting as a smoothening agent. The universal custom of applying orpiment was not only for colouring the manuscripts but also for protecting them from insect attack. Manuscripts were also made of rag-based white Kashmiri papers. Paper documents made from rag and hemp fibres sized with rice gruel without orpiment were susceptible to insect attack. The cotton cloth manuscripts were generally prepared by impregnation with rice or wheat starch paste and polishing them with stone.⁵

Use of Durable Inks in Writing

As writing ink being the prime requirement for intellectual activities, the preparation of writing ink was done carefully with an eye towards preservation. The traditional methods of preparing ink were always aimed at preparation of durable quality ink. Various formations of ink were reported in several literature^{6,7,9,10} for writing on various types of manuscripts. For

writing on the talipot palm leaves, ink was prepared from lampblack obtained from the soot of *kesadura* plant (*Verbesina scandens*) or sesamum oil and sometimes adding various other materials and vegetable gums. The ink for the birch bark manuscripts was generally prepared by boiling the almond shell charcoal with cow's urine² (*Urina bovis*) and for *sāñcīpat* manuscripts by distillation of fruit of *silikha* (*Terminalia chebula*) with bull's urine.¹⁴ Such inks were of indelible nature, still retaining their glaze. The ink for the paper manuscripts were prepared by mixing lampblack with coffee-coloured infusion of roasted rice, sugar, *kesadura* juice and acacia gum for extra gloss.¹⁰ All these indicate how the ancient writers thought about the techniques of preserving their ideas for centuries to come.

Preventive Binding and Storage

In ancient times, our intellectual ancestors realized the utility of recovering the manuscripts from external damage. The manuscript leaves were protected by keeping them in between two seasoned wooden boards generally of *śāl* (*Shorea Robusta*), *segun* (*Tectona Grandis*), jackfruit (*Artocarpus Integrifolia*), *neem* (*Azadirachta Indica*),^{11, 12} etc. or other forms of covers acting as guards and tied up with cotton thread round the whole bundles. The finished pile of palm leaves were normally strung on a cord through pre-bored holes. This practise helped to retain the manuscripts in position. The seasoned woods never changed their shape. Sometimes the inner textual portions were protected from insects and external damage by a few blank leaves placed over the first and below the last folio of the manuscript. Sometimes thicker barks were used as covers for *sāñcīpat* manuscripts.⁴

As sunlight and dust had devastating effects on the well-being of collections, stringent protective storage measures



Fig. 7.1: Tamarindus Indica

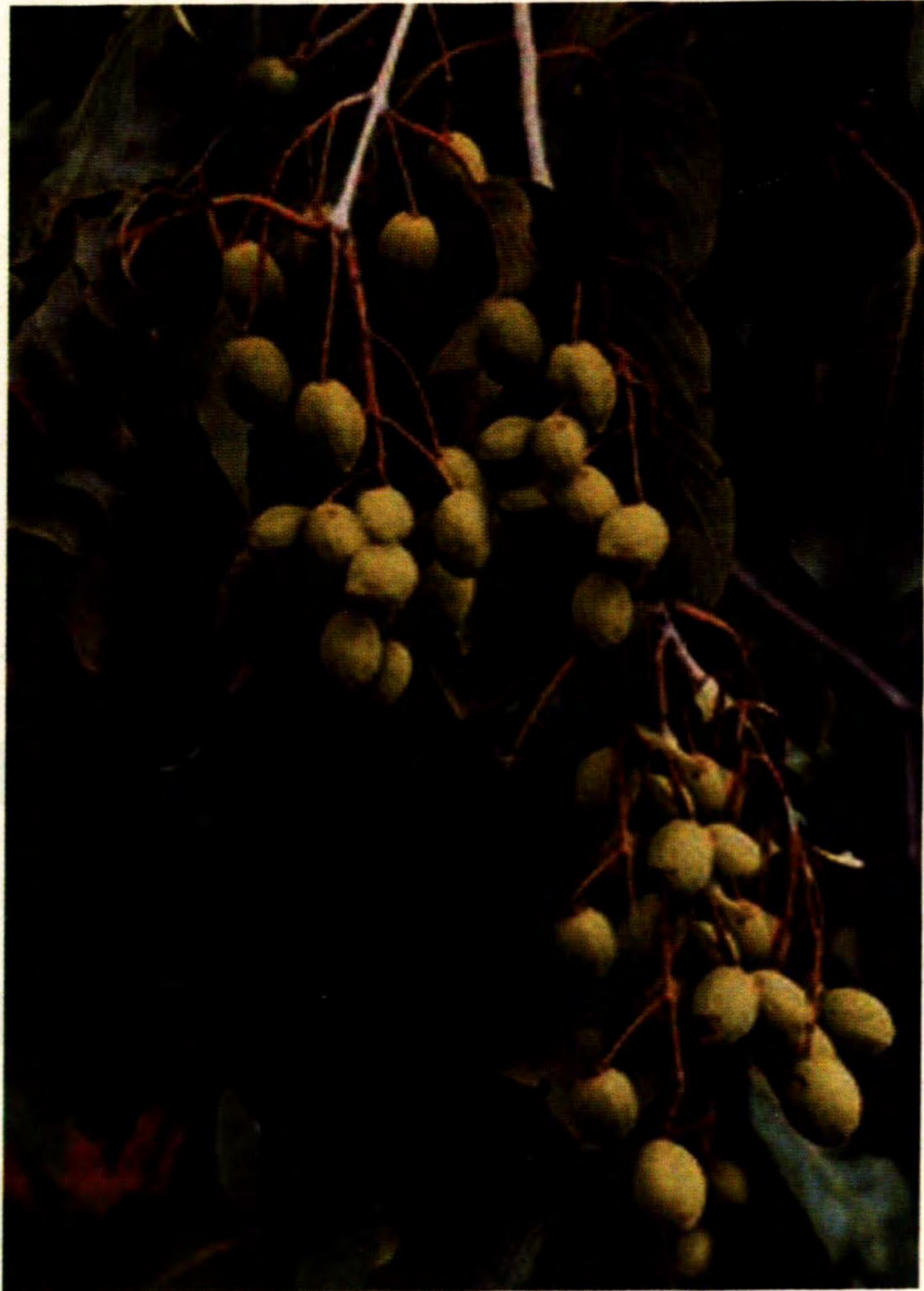


Fig. 7.2: Terminalia Chebula

were adopted to protect the manuscripts. The most conventional practice which remained unchanged for centuries was wrapping the manuscripts in red, yellow and sometimes in white cotton cloth and occasionally in silk cloth.¹² The practice of wrapping the manuscripts in cloth controlled air circulation, protected the manuscripts from dust and humidity and prolonged their life by excluding the UV fractions of light. Silk has been reported to be immune to worms and red is believed to be an auspicious as well as a repelling colour for the insects.¹² The yellow cloth covers in turmeric preparations were also used for the same reason.

It was a common practice in the ancient Indian temples and monastic libraries to store the manuscripts in pigeon-hole type wooden cupboards. Particularly in the Jain *grantha-bhāṇḍāras*, the manuscripts were preserved in insect-repellent enclosures to give the documents the first line of defence against the threats from the external deteriorating agents. It also produced a suitable microclimate around the documents to check fluctuations of temperature and humidity.^{14,15}

Care in Handling and Housekeeping of Manuscripts

The manuscripts were carefully handled and placed on the beautifully decorated wooden book cradles or book supports to minimize wear and tear at the time of reading. They were treated with high esteem, sometimes placed near the household deities and often prayers were made to them.⁷ Periodically sun-drying of manuscripts in the month of Bhādrapada, i.e. in August, helped in retarding the mildew caused due to dampness.^{9,6} Some other practices like dusting, cleaning and air drying of manuscripts periodically or on special occasions like *Vijayadaśamī* or *Sarasvatī Pūjā*,⁶ practice of exposing the documents in kitchen smoke^{2,16} or on raised

bamboo platforms to eradicate the white ants were also reported. All these practices are supposed to be effective measures against insect attack.

Traditional Insect Control Measures

Plants are “nature’s chemical factories,” providing a wide range of phytochemicals mostly aromatic essential oils, alkaloids, resins, etc. Our ancestors had discovered and utilized such plants having insect-control properties. It was the common ancient practice of keeping dried aromatic/bitter plant parts of *ghodā bac*, *neem*, *nisinda*, *aśvagandhā*, black cumin seeds, camphor, etc. in cloth sachets near the manuscripts or in between the manuscript bundles and storing them in the boxes made of repellent woods like *neem*, sandalwood, camphor, agarwood, etc. thereby ensuring a constant repellent environment around the manuscripts.^{2, 13, 13} Sometimes, the treatment with aromatic oils of repellent plants like lemongrass, turmeric (used as paste), and camphor, etc. for imparting flexibility to the manuscripts also made them insect-resistant. The insect-repellent plant materials commonly employed for manuscript preservation along with their important constituents are presented herewith.^{17, 23}

Various other materials derived from plants and animal sources like tobacco leaves, *pandri* grass, black pepper, clove, cinnamon bark, peacock feather, etc. were applied in various ways to check the menace of insects.^{2, 11, 12, 24}

Traditional Building Design

To adapt to harsh climatic conditions, the buildings were specially designed to provide passive climatic control and thereby maintain a natural air-conditioned environment. Sometimes, the library buildings were made on high grounds to check natural disasters. The repositories were built in the

Table: Plant Materials used for Control of Insects			
S.No.	Name of the Plants & their families	Parts used	Important Constituents
1.	Neem (<i>Azadirachta A. Juss: Fam. Meliaceae</i>)	Leaves/woods	Bitter limonoid compounds like Azadirachtin, Nimbin, Nimbidin, Salninin
2.	Ghoda vaca (<i>Acorus calamus L. Fam. Araceae</i>)	Rhizome	b-Asarone, Calamene, Calamenol, Methylisoeugenol
3.	Camphor (<i>Cinnamomum camphora (L.) J.S. Presl; Fam. Lauraceae</i>)	Resins/Woods	(+)- α -Pinene, bisalboline, Cineol, Terpeneol, Caryophyllene
4.	<i>Aśvagandhā</i> (<i>Withania Somnifera Dun; Fam. Solanaceae</i>)	Roots/Leaves	Bitter alkaloids Withanine, Somniferine, Withananine.
5.	Black Cumin (<i>Nigella sativa L: Fam. Ranunculaceae</i>)	Seeds	Toxic glycoside Melanthin.
6.	<i>Nisinda</i> (<i>Virex negundo L; Fam. Verbanaceae</i>)	Leaves	Alkaloids
7.	Sandalwood (<i>Santalum album L: Fam. Santalaceae</i>)	Heartwood	a-and β - Santalols (sesquiterpene-alcohols), Santalal, Satalone, Santene.
8.	Agarwood (<i>Aquilaria agsillocha Roxb.: Fam. Thymelaeae</i>)	Bark/Woods	Agarol
9.	Lemon grass (<i>Cymbopogon flexusus Nees Steud. (wats); Fam. Gramineae.</i>)	Oil	Citral
10.	Indian Wormwood (<i>Artemisia absinthium L.: Fam. Compositae</i>)	Woods	a-and β -Thujone Phellandrene
11.	<i>Haldi</i> (<i>Curcum L.: Fam. Zingiberaceae</i>)	Rhizomes	Curcumin (colouring matter), α -Phellandrene, Termerones, Zingiberine

interior part of the temples and monasteries in such a way that the thermal and hygroscopic properties of the buildings and their contents were favourable for maintaining good stable indoor climate and for protection against sunlight and storms.¹¹ Sometimes, the manuscripts were protected in the underground rooms attached with the temples.⁵

Preventive Disinfection of Environment

Our forefathers had the deepest sense of air purification which may have a relation with manuscript preservation. The burning of incense and aromatic plants like *deodār*, sandalwood, agarwood and their products, exudations of Indian frankincense or *guggul* and like materials were the essential parts of worship and religious ceremonies in Indian temples, monasteries, etc. where the libraries were mostly attached with. These materials not only maintained religious sanctity, but are also supposed to disinfect the environment.²⁵

Effectiveness and Applicability of the Traditional Methods

From the foregoing discussions it is quite obvious that the traditional means of preservation are a wide spectrum of preventive preservation techniques against various agencies that threaten the collections. A few traditional practices seem contradictory to the modern preservation ethics like sun drying of documents,^{9,6} using acidic turmeric paste,²⁶ possible contamination and migration of resinous products from wooden covers to the manuscript leaves,¹³ damage of manuscripts by the binding cords, etc. Apart from these contradictions, the traditional practices provide a number of compatible, environmentally sound, non-hazardous, cost-effective and time-tested means that can be effectively employed in the Integrated Pest Management of under-

developed libraries, scattered everywhere in our country, which are lacking in funds and infrastructure. Such organizations may benefit by adopting the easily accessible and practical traditional method of preservation. The National Library of India has a sizeable collection of various types of manuscripts which have been well-preserved by employing a few of our traditional preservation means along with modern methods with success.

Conclusion

The world of document preservation is gradually becoming more and more technology-oriented. We have been gradually shifting from our inherited natural methods to the world of synthetic chemicals by deploying more and more funds, infrastructure, etc. The problem of manuscript preservation, however, still persists. It is, therefore, high time to think of the problems underlying the present preservation trends very seriously. Our traditional preservation methods may be the alternative means to safeguard our heritage for posterity and their application should be encouraged.

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The Use of Turmeric in the Preservation of Manuscripts

S. SUBBARAMAN

Abstract

There is a long tradition in India of the use of turmeric as a prophylactic. It has been proven that it contains antiseptic properties. It is common that turmeric is one of the materials used for seasoning palm leaves and preparing them for writing. Paper too may be treated with turmeric, and owing to its use in the past, many old manuscripts have remained free from fungal attack, even under conditions of high humidity. This paper proposes to highlight the distinct properties that make it such an effective preservative material for manuscripts.

Introduction

IN administering and taking medicine for different ailments, it is sometimes found that while the drug serves its main purpose of curing the disease, there are certain undesirable side effects, and therefore, one has to be careful of taking such a drug. Similarly, we have to adopt a cautious approach in the use of chemicals for conservation procedures. The chemicals may in the long run have an adverse effect on the valuable materials subjected to treatment, and they may even

prove hazardous to the people handling them. This is the reason why a chemical has to undergo rigorous testing for ascertaining its short- and long-term effects, before it is approved for use in conservation.

The use of natural products in place of chemicals can therefore be proposed. For instance, for the prevention of insect attack on Palm-leaf manuscripts, if a natural product like *neem* leaf or sweet flag is found to be effective, it is better to use it rather than a synthetically produced chemical substance. The natural product is much less likely to have an adverse effect on the Palm-leaf as well as on humans. It is in this context that indigenous techniques of preservation assume importance since these techniques make use of natural products. This paper deals with one such product, turmeric.

What is Turmeric?

Turmeric (Botanical name: *Curcuma longa* Linn.) is a perennial herb of the ginger family (*Zingiberaceae*). It grows to 2-3 ft. in height with a short stem and tufted leaves. The rhizomes, which are short and thick, constitute the turmeric of general usage. The plant is a native of South Asia and is grown on a large scale in India and South-East Asian countries.

Curing and Preparation

The rhizomes, which are brownish yellow in colour, consist of a central bulbous portion bearing a number of finger-like lateral offshoots. The bulbous and finger-shaped parts are separated, freed from adhering dirt and fibrous roots and subjected to a process of curing and polishing. The curing involves cooking the rhizomes in boiling water until they become soft. This may take a few hours. The cooked rhizomes are allowed to cool gradually and spread out in the open to

dry. The dried rhizomes are polished either by hand-rubbing or rotation in a mounted drum. The length of dried rhizomes may vary from one to three inches in length. Turmeric is usually sold in the market in the form of powder that results from grinding the rhizomes.

Traditional Uses of Turmeric

The use of turmeric dates back nearly 4000 years to the Vedic culture in India where it was used as a culinary spice, medicine and also had some religious significance. Some of the uses of turmeric are:

1. *Culinary Use:* Turmeric is used extensively in the East and Middle-East as a condiment and culinary dye. It is used in curries and curry powders, rice dishes and added to chutneys and pickles.
2. *As a Dye:* It is also used for dyeing wool, silk and unmordanted cotton to which it imparts a yellow shade in an acid bath. It is sometimes used in combination with other natural dyes like indigo and safflower to impart different shades.
3. *As an Indicator:* Turmeric paper is a reagent in the British Pharmacopoeia for testing alkalinity. In the alkaline medium it turns from yellow to reddish brown. It is also used as a test for alkaloids and boric acid.
4. *Medicinal Use:* In Indian systems of medicine, turmeric is used as a stomachic, tonic and blood purifier. Mixed with warm milk, it is said to be beneficial in common cold. The juice of the fresh rhizome is used as an anti-parasitic for many skin ailments. Turmeric paste is applied externally on open wounds as it is said to have antiseptic properties. *Curcumin* in turmeric has been

shown to be active against *Staphlo coccus aureus* (pus-producing infections). It is an antacid and in small doses it acts as a carminative and appetizer.

- 5. *As a Cosmetic:* In parts of Asia, turmeric water and paste is applied as a cosmetic to lend a golden glow to the complexion. Indians as well as Indonesians apply turmeric on their bodies as part of their wedding ritual.

Uses of Turmeric in the Preservation of Manuscripts

- 1. In certain regions, particularly in Orissa, turmeric paste is applied on the surface of Palm-leaf when processing and preparing it for writing.
- 2. In paper manuscripts, every third or fourth folio is sometimes found to be coated with turmeric. We can see examples of such manuscripts in the Saraswathi Mahal Library of Thanjavur, in Tamil Nadu.

Manuscripts so treated are found to be protected from fungal attack.

Chemistry of Turmeric

- 1. Analysis of Indian turmeric has given the following values:

Moisture	13.1%
Protein	6.3%
Fat	5.1%
Mineral matter	3.5%
Fibre	2.6%
Carbohydrates	69.4%

Carotene 50.0 I.U./100g.

(Calculated as Vitamin A)

2. Steam distillation of the dry rhizomes yields 5-8 per cent of an essential oil, with a density of 0.929 and refractive index of 1.5054. It consists mainly of *Turmerone*, a *Sesquiterpene* (58 per cent). The other major constituent is *Zingiberene* (25 per cent), another *Sesquiterpene* found in ginger. Smaller quantities of *d-phellandrene* (1 per cent), *d-sabinene* (0.6 per cent) *Cineol* (1 per cent) and *borneol* (0.5 per cent) have also been identified.
3. A *ketone* and an alcohol identified as *p-tolymethyl carbinol*, have been obtained from the volatile distillate.
4. A crystalline colouring matter, *Curcumin* (0.6 per cent), with melting point 180-183 degrees celsius, is obtained from turmeric. This has been identified as *Diferuloyl methane* and it dissolves in concentrated Sulphuric Acid giving yellow colouration.

Concluding Remarks

The phenolic character of curcumin probably accounts for its germicidal property, and therefore its usefulness as a preservative for Palm-leaf and paper manuscripts includes its ability to inhibit fungal growth. The essential oils in turmeric, consisting of *Turmerone* and *Zingiberene*, which are of the **Terpenoid** group, also contribute to its preservative properties. While its yellow colouration may render it unsuitable for general use as a preservative, turmeric certainly has some specific applications in the preservation of manuscripts in a very effective manner.

Interventions

Vipul Shah: How do we know that the natural product is up to the standard?

Dr. Subbaraman: The chemical constituents will have to be ascertained first to verify if the material is up to the standards.

Ratna Basu: Cupboards or cases can be washed with turmeric water or a paste can be applied too. The wrappers can be washed in turmeric water too. We are employing this practice and getting good results.

A.S. Bisht: Over the years the use of turmeric has been propagated. Even today, we are only mentioning the fact that the material can be used. What about the process and the method of introduction of the material? That must be given thought to also at the same time.

S. Bapat: Is turmeric paste acidic?

A.S. Bisht: Why get scared of acidity. It is the scale that is important. Some acidity may even help to preserve paper. Turmeric solution in water has been used in the past.

Traditional Methods of Conservation of Paper Manuscripts As Gleaned from Two Persian Texts

IMTIAZ AHMAD

Abstract

Our forefathers devised simple ways and means to ensure the preservation of manuscripts. Some of these methods are now broadly referred as "conventional" methods and are still in use. In this connection, one particular text is of immense value and interest. It deals with the tools and techniques of penmanship and describes the different types of papers, ink, and pen used for writing of manuscripts and also the method involved in their preservation. It is in this context that the quality of the different types of papers and ink involved in the preservation of the written texts is highlighted. It also spells out the conditions in which books should be kept to ensure that they remain safe from insects and also the vagaries of nature. The aforesaid information may enable us to unravel some of the secrets of preservative methods and techniques used in the seventeenth and eighteenth century which are cheaper and convenient. The treatment of existing manuscripts with the materials mentioned in the book may help in improving their longevity and endurance.

Introduction

Manuscripts constitute the intellectual and academic heritage of any country or society. They preserve the traditional wisdom and learning of yore. India, with its hoary and glorious past is perhaps the largest repository of such manuscripts in a number of languages, written on a variety of materials, such as Palm-leaf, birch, cloth, leather and paper. Paper manuscripts, in India, have a direct relation with the medieval period. The Turks brought the use of paper as a writing-material to India in the thirteenth century. Thereafter, Persian and Arabic texts, written by hand on paper, in an increasingly large number and variety came to be composed. Most of these texts related to history, religion, philosophy, literature, sciences and other branches of learning. Invariably, these were richly decorated and illuminated. The tradition continued with vigour till about the close of the eighteenth century. The coming of the printing press ushered in a totally different situation. However, the manuscripts for their calligraphic beauty and the ornamental decorative techniques, as well as their basic subject-content, still enjoy great importance not only among scholars and connoisseurs but also among the general people.

Two Persian Texts

Referring back to the developments in the thirteenth century, one may say that the period heralded a sort of revolution in North India. Together with the writing of books on paper, there also developed the varied ancillary arts of decoration, illumination, binding and gilding of books. This, in turn, gave rise to crafts such as manufacture of paper, ink, making of pens, use of natural dyes and their extraction, manufacture of gum and resin, making of leather-sheets for the purpose of book-binding, etc. Many such techniques, and the experiments

made in that connection have been recorded by perceptive observers. Consequently, we have had some interesting Persian texts that deal with the details of such crafts and techniques. At the same time, they also shed valuable light on the materials used for conservation and preservation. The present paper draws attention to two such Persian texts, the *Bayād-e Khuṣbuī*¹ and the *Tuhfat al-Wurūd*.² Though not exclusively devoted to the techniques of conservation, both devote a major portion of their contents to the tools and techniques of penmanship. In that context, they also provide sporadic but useful information on the ways and methods of ensuring a long life for the manuscripts; in other words, their preservation and conservation.

Bayād-e Khuṣbuī

The *Bayād-e Khuṣbuī* was written earlier and is larger in content than the *Tuhfat al-Wurūd*. It was written in the seventeenth century and it deals mainly with the household/establishment of the nobles. In the eight chapter of the Manuscript, the Chancery or Department of Writing is mentioned. There is a detailed description of the manufacture of paper, its colouring, decoration, the use of various ingredients, etc. The text is yet to be edited and published.

Tuhfat al-Wurūd

The *Tuhfat al-Wurūd* is a relatively later work, though it too was written in the seventeenth century. The author 'Abd al Mun'im was a professional calligraphist who shared his experiences of making pens and ink used in writing. The

1. *Bayād-e Khuṣbuī*, unpublished text, Aligarh Muslim University (AMU) microfilm.

2. *Tuhfat al-Wurūd*, unpublished text, personal copy.

description given by him of the techniques and ingredients of making ink which does not easily fade out nor washes out with water and also the information given by him about the different types of inkpots and the effect they have on the storage of ink make interesting reading. Unfortunately, this text is also yet to be edited and published. But, significantly, the ingredients and techniques mentioned in both texts are purely indigenous. This makes the two texts particularly important for our purpose.

Relevance to Preservation

It is a well-known fact that the ravages of time, natural factors, human neglect — or more seriously, mishandling — have taken a considerable toll and many manuscripts face the challenge of deterioration, mutilation or even extinction. It is our responsibility to see that these problems are overcome and the wisdom of the past that has survived till the present is preserved for posterity. The National Mission for Manuscripts is seriously engaged in this most daunting task. However, the challenges and the determination are not new. Our forefathers too devised ways and means to ensure the preservation of manuscripts. Many of the simple — often crude by modern standards — methods adopted by them were, nevertheless helpful in fulfilling the desired objective. These methods are now broadly referred to as “conventional” or “traditional” methods and some of these are still in use. Our experiences in this venture have made us realise the efficacy of some of these methods and also the need to perpetuate the same.

In this connection, the aforesaid texts are of immense value and interest. They deal with the tools and techniques of penmanship and describe the different types of papers, ink

and pen used for writing manuscripts and also the method for preparing these and the ingredients used in the process. They shed valuable light on the qualities of different types of papers and ink which helped in the preservation of the written texts. They also spell out, in some instances, the conditions in which books should be kept to ensure that they remain safe from insects and also the vagaries of nature. They are useful because they present before us an idea of the in-built mechanism for preservation of manuscripts. The use of special care in making of paper and ink and its storage so that it contributes to the perpetuation of the life of the manuscript makes interesting reading. Some of the techniques and ingredients mentioned in these texts may provide new opportunities and possibilities in the work of conservation and restoration of damaged manuscripts. Moreover, they also enable us to have a better appreciation of the care and concern shown by the bygone generations for preservation of the written word. They also offer a possibility of comparing the existing traditional methods and techniques with the past background outlined in these texts.

Conservation Related Observations in the Persian Texts

The present paper deals with the contents of the above-mentioned texts and explores the possibility of the use of similar techniques, which are cheaper and convenient. The treatment of existing manuscripts with the materials mentioned in these texts may help in improving their longevity and endurance.

We may now take a more detailed look at the contents of the two texts. A beginning may be made with the *Bayād-e Khushbuī*. As mentioned earlier, the eighth chapter of the book deals with the techniques and ingredients of the manufacture

of paper. Some of the ingredients used for colouring the paper include saffron, lemon oil, pomegranate-oil, cinnamon, apple-peels, *sabza* (possibly grass) and salt.³ There is also a passing reference to the fact that these ingredients give the paper better lustre, enable a more accurate drawing of designs and floral patterns for decoration and ensure their longevity. Unfortunately, the exact manner in which this works has not been discussed at length. This lacuna does, in a way, affect the utility of the information but it also invites attention to the possibility of exploring the possible use of these ingredients and techniques for the purpose of conservation of manuscripts.

The account in the *Tuhfat al-Wurūd* is somewhat more detailed. It focuses mainly on the making of pen and ink and the proper storage of ink. It comments upon various types of inkpots and the impact they have on the quality of the ink. To quote some of these observations:

. . . the ink turns white in an inkpot made of stone and its blackness is wasted [*sic*]. Similarly in coloured inkpots the ink turns white and camphor-like. If you write with such ink the brightness of the script is lost. Similarly in the inkpots made of white glass black-ink loses its colour and shine. In the case of wooden inkpots, the ink tends to dry and the flow of writing is obstructed. . . . Inkpots made of porcelain or copper are far better. For one thing, they do not absorb much ink. Even if the ink gets dried you can lighten it by mixing a small quantity of water. More importantly, ink kept in such inkpots does not lose its glaze or lustre easily.⁴

The technique for making ink makes interesting reading⁵ even though the process by itself appears quite cumbersome. It is

3. *Bayād*, op. cit., 236 ff.

4. *Tuhfat*, op. cit., f. 24 ff.

5. *Ibid.*, f. 36 ff.

advised that one should take a small, clean piece of unstarched white-cloth, dip it three times in indigo-leaf extract and dry it in shade. He should then make a wick of it and burn it in a glazed lamp (so that the oil may not be absorbed by it), fill it with mustard oil and burn the wick in the lamp in a cool and shaded place where the breeze is not very strong. The lamp should be covered by a hemispherical mud-cover. The soot should be allowed to settle on the inner side of the cover. It should then be collected and tied up in a white-cloth. It should be dipped in wine and kept inside a paste made of gram-flour. After a short while, it should be placed, for about two hours, under the ashes of an extinguished bonfire, preferably during the night. It should be allowed to cool for sometime. The covering of gram-flour and cloth should then be removed and the paste carefully dissolved in water. The quantity of water may be determined as per need. The resin of the Neem-tree should be separately obtained, boiled in water in an iron vessel. It should then be mixed with the ink and the settled particles carefully drained out. A pinch of alum, cinnamon and salt should be separately boiled and the extract mixed with the ink. It should be stored in proper ink-pots. It may be added here that in an earlier context, the author has cited porcelain ink-pots as the best for storage of ink.

Concluding Remarks

The aforesaid information may, perhaps, enable us to unravel some of the secrets of preservative methods and techniques used in the seventeenth and eighteenth centuries. This, in turn, may give us a better perspective on the conventional methods of preservation. This may also enable us to check whether these techniques and ingredients are still in use. As we all know, calligraphy, though a dying art is not yet extinct. Many

of the *madrasas* still teach the art. It may be ascertained whether it is possible to employ similar techniques now for making ink and paper, besides pen — the techniques for which have also been discussed in the *Tuhfat al-Wurūd*, but left out in the present presentation, so as to ensure the endurance of these works. An attempt should also be made to locate other identical texts, especially those that may enable us to unravel the techniques used for making paints and colours that were employed for decoration and illumination of books. One can also perhaps explore the details about preparing the covers used for the books. It is interesting to note that the quality of the leather used in many of these covers is very good and it has endured for several centuries.

More importantly, when it comes to the restoration or retouching of the old, damaged or worn out texts, can these techniques and components be of effective help? Can they contribute not only to the restoration but the future conservation of the written heritage? Possibly, a two-pronged strategy may be adopted in this regard. On the one hand, such texts, and there must be several more besides those mentioned in this brief presentation, should be taken up for a careful study, editing and translation. On the other hand, experimental attempts may be made to employ these methods for our present needs as far as the conservation and repair of old paper-written manuscripts are concerned. The Mission may, perhaps, at a later stage examine these possibilities for it is important not only to preserve the written word but also the tools and techniques of penmanship that produced those records.

Interventions

Shreenand L. Bapat: Is the paper of Samarkand and Bukhārā really better than the Indian paper?

Imtiaz Ahmad: I would say yes. Two things are mentioned in the text, that the Persian paper has longer life and greater endurance. The paper of Central Asian origin survives for a longer period. The texture is suitable for writing well. The *Kitāb al-Hasā'is* is a manuscript that is more than 1000 years old. It describes 350 medicinal plants and herbs and is replete with coloured sketches with comments on the medicinal qualities of the plants and herbs. Keeping in mind this fact of its age, we observe that even today the ink is firm and colours are intact. This reflects on the quality of the paper too.

Vipul Shah: There is the practice of keeping silk cloth in the ink pot so that the tip of the pen will not break.

Imtiaz Ahmad: Very valid point but it has not been mentioned in these two texts. It is, however, a very good point.

Ratna Basu: In the *Abhilāṣitārtha-cintāmaṇi*, in the Commentaries of the *Kāmasūtra* by Vātsyāyana and in several *Lekhapaddhati*, it is mentioned that when neem-leaf juice is boiled in an iron pot, the proportion should be carefully maintained. If the content of iron is higher, then it will damage the paper. Therefore, do not make the concoction out of proportion or it will char the paper.

Imtiaz Ahmad: Neem juice and other solutions are even mentioned in earlier texts and this goes on to show the continuity in the system till as recent as the seventeenth century.



Awareness and Practices of Manuscripts Preservation in Ancient and Medieval India A Review of Literary Evidence

SHREENAND L. BAPAT

Abstract

The Indian tradition of learning has predominantly been an oral tradition. As writing was popularized, copying and recopying of texts became the most important way of protecting content, and was considered by some modern day scholars as the only way to preserve manuscripts. There have been, however, some reflections on the preservation of manuscripts and documents in ancient and medieval Indian Literature, the Aśokan edicts, the *Arthaśāstra* of Kauṭilya, Purāṇa's Dosabodha and the medieval saint literature, to name a few. Though the purpose of these texts was not to describe preservation as such, they contain references to the concept and process of conservation. These references are important links to the practice of conservation in ancient India. This paper, with the help of textual data, attempts to highlight the knowledge, awareness and the practice of Manuscript preservation in ancient India.

Introduction

The ancient Indian tradition of learning was predominantly an oral tradition. Just as the Vedas along with their Aṅga's were transmitted orally from generation to generation in a formal manner, the epics and the Purāṇa's were disseminated informally through the bardic tradition before they were written. A Kṣatriya therefore, a person who had "heard" much *vis-á-vis* a "well-read" person of the modern times. It seems at least some adherents of the oral tradition looked down upon the practice of writing and this is reflected in a verse that counts "reading from books" in the list of hindrances to learning.¹ This confrontation between learning "by heart" and writing seems to have not lasted long as we find in the *Atharvaveda* a clear reference to replacing the books safely into the boxes whence they were taken.² This verse reflects the consciousness of contemporary learned society regarding preservation of scriptures. This consciousness is also reflected from Kauṭilya's advice for construction of a separate building for archives, wherein the official records of the state would be repositied³ as also from Aśoka's sermons being inscribed on rock for durability.⁴ Similarly, Kaṭāhaka the hero of the *Kaṭāhaka-jātaka* (believed to have been canonized in the first century BCE), has been said to be a *Bhāṇḍāgārika*, record-keeper.⁵

1. *dyūtaṃ pustakaśuśruṣā nāṭakāsaktireva ca |*

striyastandrī ca nidrā ca vidyāvighnakarāṇi ṣaṭ ||

2. *yasmāt kośād udabharāma vedam tasmin atah avadadhma enam |*

— *Atharvaveda* 19.72.1

3. *akṣapaṭalamadhyakṣaḥ prāṇamukhamudānmukham vā |*

vibhaktopasthānam nibandhapustakasthānam kārayet ||

— *Kauṭilya Arthaśāstra* 2.6

4. *iyam dhammalipi lekhaṇpitā kimti ciraṃ tiṣṭeya iti.* Edict 2.

5. *seṭṭhiputte lekham sikkhante eva dāso pi ssa phalakam vāhamāno gantvā teneva saddhitam lekham sikkhi gaṇanam sikkhi . . . kaṭāhako nāma . . . bhāṇḍārikakamma.*

Early Literary Evidence for Manuscript Preservation

The earliest evidence of materials for covering and binding together folios of manuscripts goes back to the third century CE. The *Rāyapaseṇīyasutta* mentions the use of *Kambi*, *Ḍorā*, *Granthī* and *Chādana* (wooden boards, cord, knot and covering cloth respectively) for the purpose.⁶ Similarly, the Sinhalese tradition of Buddhist learning has recorded an interesting account of Upāli, who had brought to Ceylon a manuscript of the Vinaya from India in 489 CE.⁷ The account speaks for a practice of marking a red dot on the opening folios of manuscripts on every New Year day. It is reported that the manuscript possessed 975 dots when it arrived in Ceylon. The manuscript should thus be “dated back to” 486 CE. Perhaps it could also be inferred from this citation that the people were aware of the concept of “antiquity” of manuscripts.

Deterioration of Manuscripts

Rājaśekhara the author of the *Kāvya-mīmāṃsā*, a work on Sanskrit and Prakrit poetics, has referred to several causes of loss of a text. The causes include: (i) careless storage; (ii) sale (to a careless person); (iii) giving away; (iv) owner's withdrawal from a place; (v) insects; (vi) fire; and (vii) water (disaster).⁸ The same author has further mentioned that the owner's poverty, intoxication or calamity, neglect, misfortune, and trusting wicked or untrustworthy persons are the causes

6. . . . *patra, kambī, dāro, garanthī, lipyāsana, chādana, śṛṅkhālā, masī, lekhanī, akṣara*. — p. 50

7. J. Takasusu, “Pali Elements in Chinese Buddhism: A Translation of Buddhaghosa's *Samantapāsādikā*, A commentary on the Vinaya Found in Chinese Tripitaka,” *JRAS*, 1896, pp. 415-39.

8. *nikṣepo vikrayo dānaṃ deśatyāgo'lpajīvanam |
truṭiko bahnirambhaśca prabandhacchedahetavaḥ ||* — 10.53

of loss of a scripture.⁹ Rājaśekhara has further prescribed the use of boxes, wooden covers for manuscripts and has also advocated the need of having well-plastered walls in the room where the poet would compose¹⁰ and this room would have also been the manuscript repository.

Ritual Worship of Manuscripts

There has been and still prevails the practice of worshipping manuscripts at regular intervals. That scholars were aware of the possible degeneration of the manuscripts occurring through this practice and that this practice was frowned upon by some and also considered not easy to be done away with is evident from Subhāṣita that opposes this practice by saying: “(if at all a manuscript has to be worshipped), the manuscript should be worshipped with dry and insect-free flowers and ointments. If at all it has to be given a bath of water, its image falling in a mirror (kept behind the manuscript for the purpose) should be given the bath,”¹¹ Various other famous Subhāṣita also advise to take care of manuscripts.¹²

9. *dāridryam vyasanāvagatiravajñā mandabhāgyatā ।
duṣṭe duṣṭe ca viśvāsaḥ pañcakāvya mahāpadaḥ ॥ — 10.54*

10. *tasya (kaveḥ) samputikā sapthalakakhatikā, samudgaka, salekhanīkama-
śībhājanāni tāḍpatrāṇi bhūrjatvaco vā salohakaṇṭakāni tāladalāni
susammrṣṭā bhittayaḥ satatam samnihitāḥ syuḥ — 10.60.*

11. *gandhairnirūdakaiḥ puṣpaiḥ kṛmīkīṭavivarjitaiḥ ।
darpaṇe pustakam dṛṣṭvā secayet pūrvavad ghaṭaiḥ ॥*

12. *tailādrakṣejjaladrakṣecchithilavandhanāt.
mūrkhahaste na dātavyamevam vadati pustakam ॥
samabhūṣyam sadapatyavat parakarād rakṣyam ca sukṣetravat ।
samśodhyam vranītāṅgavat pratidinam vīkṣyam ca sanmitravat ॥
badhyam badhyavadaślatham dṛḍhaguṇaiḥ smaryam harernāmayan ।
naivam sīdati pustakam khalu kadāpyetad gurūṇām vacaḥ ॥ etc.*

Practice of Writing and Storage of Manuscripts

Rāmadāsa, the saint from Maharashtra in the seventeenth century CE has written a chapter on the practice of writing. As regards preservation, he has referred to (i) the use of strong paper; (ii) the paper being burnished well; (iii) boards of imported* wood for storage; (iii) strong silk threads; (iv) pieces of cloth for covering; and finally (v) red coloured wax-treated cloth in order to avoid the entry of moisture in the manuscripts.¹³ The Rājavyavahārakośa, dated 1677 CE, a lexicon of Raghunathpant Hanmante, a minister of Shivaji the Great, has mentioned the use of cord, covers, hard boards, cloth covers and finally wooden boxes for safe storage of the official records of the State.¹⁴ Pliny too has reported the “use of citrus oil for preservation of books against moths.”¹⁵

Preservation of the Contents of a Manuscript

By preservation of the scriptures, the tradition may perhaps also imply the preservation of the written matter, and maybe not necessarily that of the physical form of the manuscript. There are numerous references to preservation of the ink, in the case of manuscripts and of the paint in the case of paintings.

* Burmese teack?

13. *Natural History*, vol. IV, Book XIII.

14. *ghaṭya kāgada āṇāve. japona nemasta khalāve. lihinyāce sāme asāve. nānāparī. sūnyā kātanya jāgāita. khalī ghoṭāle tāgāita. nānā suraṅgamiśrita. jāṇoni dhyāve. — 19.1.14-15*

tāgaṭī itīśryā karāvyā. baṁdari phalyā ghoṭāvyā. nānācitṛīm citārāvyā. ucam citrem. nānā gopa (gopha) nānā bāsane. menākāpaḍe sinduravarṇem. peṭyā kulupem japanem. pustakāraṇem — 19.1.19-20

15. *āhuḥ kāgalasūtram tu tablakhm nāma kovidāḥ. jilīdo lekhabandhaḥ syād bastanī nāma veṣṭanī. jñeyam jilīdapuṣṭam tu pṛsthapatram vicakṣanaiḥ. tathā veṣṭanavastram tu rumālah parikīrtitah. peṭārā peṭakah jujḍānam nāma samīcīkā. — Lekhanavargah, 110-11*

Some such references are (i) The *Citrasūtra* of the *Viṣṇudharmottarapurāṇa*, of the fifth century CE, mentions the use of the juice of *Mataṅga* and *Durvā* for preservation of the paint. It further says that the paint in such an illustrated work does not get lost even if it is washed with water¹⁶; (ii) The *Lekhapaddhati*, a medieval text, prescribes a manner for preparation of ink that is “harder than diamond”;¹⁷ (iii) The *Dāsabodha* of Rāmadāsa refers to the handwriting not getting lost even when the paper is lost.¹⁸

Durability of the Paper

The late Rajendra Lal Mitra referred to hand-made paper for its strength and longevity as compared to the newly introduced “English foolscap (machine-made) paper” in his letter written to Capt. J. Waterhouse, Secretary of the Asiatic Society, Calcutta, on February 15, 1875. He has also cited the

16. *mātaṅgadurvārasapaṭṭabaddhaiḥ saṁstambhitam citramudārapucchaiḥ* ।

dhautam jalenāpi na nāsameti tiṣṭhatyanekānyapi vatsarāṇi ॥ — 40.30

17. *maṣyāmnāyaḥ. ubhayorapi masyormahārāṣṭrabhāṣayā deralīti prasiddhasya riṅgaṇīrṣkṣasya vanaspativiśeṣasya satkatakasya phalarasasya madhye prakṣepe satejastvamakṣikābhāvādayo guṇā bhavanti . . . bhaplūvaghūgha(?)rasena ekaikam kṣiptvā sarvāṇi patrāṇi hā(ā)hana. kophali (āhatakopari?) mardante. tadanantaram piśāśvathābhidham tavakṣīlā(rā)paranāmacūrṇam madhye muktvā tanmānenāmbu pūryate. pacāccūrṇam vinā dvitrāṇi dhāvanī(nā)ni nītārya(ya) nītārya(ya) prakṣālyante. tadanantaram vilomajjvalā payasīṁkai(?) pīlītu ca syāditi . . . khāṇḍa bola anai lakkhārasa kajjala bajjala anai trambārasa. bhojarāja misi nipāi pānaum phāṭai misi navi jāi. bolasya dviguṇo gundo gundasya dviguṇā maṣī. mardayeddyāmayugmam tu maṣī vajrasamā bhavet.*

18. *bhōvaterṁ sthala sodūni dyāve. madhyemci camacamita lyāhāverṁ. kāgada jhadatāmhi jhadāverṁ. nālageci akṣara.* — 19.1.11

prevalent Bengali practice of keeping the manuscripts on the wooden lintels of the houses for safeguarding them from insects.¹⁹

It seems in the unfathomed mass of literature one may find immense material on this topic of indigenous practices of preservation of manuscripts. This paper is a small attempt to draw the attention of the scholars to the ancient and medieval literature that refers to preservation of manuscripts.

Interventions

Dr. Imtiaz Ahmad: These references are very useful and I am thankful to Mr. Bapat for making this effort to compile them and place them before this audience.

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19. Manuscripts written on country paper sized with yellow arsenic and emulsion of tamarind seeds . . . white arsenic is rarely used for it, mucilage employed in such cases being acacia gum. Ordinary paper sized with rice gruel, but such paper attracts damp and vermin of all kinds . . . silver fish . . .

. . . The superior appearance and cheapness of European paper has of late induced many persons to use it, instead of the country arsenicized paper, writing pothis; but this is a great mistake, as the former is liable to be rapidly destroyed by insects (He has cited here examples of European paper of 1830 *vis-à-vis* manuscripts of the Fort Williams of 1801). . . . This fact would suggest the propriety of Government records in Mufassil Courts being written on arsenicized paper instead of ordinary English foolscap which is rapidly destroyed by climate and also by white ants. . . . Ordinary yellow paper (with turmeric) is not proof against attacks of insects. — R.L. Babu Mitra to Capt. J. Waterhouse, Secretary, *Asiatic Society*, February 15, 1875 (in A.E. Gough (ed.), *Papers Relating to the Collection and Preservation of the Records of Ancient Sanskrit Literature*, Office of the Superintendent of Government Printing, Calcutta, 1878, p. 15.



Traditional Practices and Palm-leaf Manuscripts in Tamil Nadu

V. JEYARAJ

Abstract

Many Palm-leaf manuscripts have been preserved in institutes, libraries, and *mathas* in Tamil Nadu. Traditionally, seasoned Palm-leaf manuscripts were made available for writing both in the scholarly circles and by common folk and were freely available. Natural liquids like oil, milk, turmeric, lime, red ochre etc, were used in the preservation of manuscripts. Siddhā medical practices were also used in the preservation of manuscripts. This paper deals with the herbal and natural materials used during preparation, storage, and handling of Palm-leaf manuscripts.

Introduction

A lot of Palm-leaf manuscripts have been preserved in institutions, libraries and *mathas* in Tamil Nadu. Traditionally Palm-leaf manuscripts were made available for writing for scholars, administrators and common folk. Seasoned palm-leaves were available in the shops for this purpose just like paper is available in shops today. In the preservation of manuscripts, Siddhā medical practices were also in vogue in

the ancient past. The Siddhā Medical Practitioners are trying to find out the ancient methods of preserving the manuscripts by searching for new information in the available Palm-leaf manuscripts. This paper deals with herbal and other natural materials used in the preparation, storage and handling of the Palm-leaf manuscripts.

While parchment and Bhūrja Patra, (birch bark) were common in North India, palm-leaves were the main writing support in South India. Leaves from the Country Palmyrah (*Borassus flabellifer*), Śrītāla (*Corypha Umbraculifera*), and Lanthar Palmyra (*Corypha Utan*) were the ones used for writing, and sometimes illustrations were also made on them. In the preparation of Palm-leaf manuscripts itself, preservative methods were adopted right from the seasoning stage itself.

Methods of Seasoning the Palm-leaf Manuscripts

Seasoning is a process by which the leaves are able to withstand the effects of the environment, thus prolonging the life of the leaves. There are many methods of seasoning depending upon the environment, availability of local resources etc. The tender leaves that are four to five weeks old are cut into the required size and dried under shade or buried under marshy water. Some other methods of seasoning are:

- Boiling the leaves in water, milk or turmeric solution
- Baking the leaves in steam
- Keeping the leaves buried in wet sand
- Keeping the leaves in a moist haystack
- Applying Gingeli oil and allow the leaves to absorb the oil

Such seasoned palm-leaves are then inscribed by a metal stylus.

Method of Writing and Inking

Palm-leaf manuscripts were written either by stylus or by brush using ink. The inscribed letters are of the colour of the leaf and therefore difficult to read. The essence of Kadukkai (*Terminalia Chebula*) or green leaves of Kovakkai plant (*Coccinia Grandis*) was applied on the inscribed portions to make them appear black and easily legible. From early times, soot mixed with vegetable gum has been used as ink. Iron gall inks obtained from the seed of the gall fruit, containing tannin and iron oxide, have also been used. Commercial inks are being used these days for inking the manuscripts.

Re-inking the “Faded” Text

Frequent handling as well as heat and microbial activity obliterate the ink, and when this “fading” happens, there is a need for the manuscript text to be re-inked. This is done again by rubbing into the incised text Kadukkai essence, Kovai plant leaves or lampblack mixed with oil.

Use of Oils for Preservation of Palm-leaf Manuscripts

When Palm-leaf manuscripts become dry, various oils are applied as softening agents to impart flexibility to the manuscript folios. These oils are extracted from plants and some of these oils are also employed as insect repellents and to counter fungi. The mostly useful oils have been listed below:

- Cedar wood oil
- Citronella oil
- Lemon grass oil

- Olive oil
- Eucalyptus oil
- Sandalwood oil
- Turpentine oil
- Palm-leaf oil

Traditional Preservation with Herbs

Various parts of plants and their products such as oils, flowers, bark, seeds, resins, roots and leaves have been used traditionally in the preservation of Palm-leaf manuscripts. Many of these natural materials are insect repellents and are kept dried whole or in the powdered form along with the manuscripts. Ghora bach (*Acorus calamus*) is very effective as are Ginger, sandalwood powder, powdered seeds, leaves and roots of *Tephrosia Vogeli*. Leaves of Neem (*Azadirachta indica*), Tobacco (*Nicotiana tabacum*), Tulasī (*Ocimum basilicum*), Adhatoda (*Adhatoda Zeylanica*) and Chrysanthemum (*Chrysanthemum cinerariaefolium*) have been extensively used by the ancients to protect the manuscripts from deterioration.

At the Saraswathi Mahal Library, Thanjavur, the following are pulverized after drying under shade and kept in small cloth sachets in between the bundles of the manuscripts:

Black cumin	1 Part
Cinnamon bark	1 Part
Sweet flag	1 Part
Pepper	¼ Part
Cloves	¼ Part
Green camphor	little bit



Fig. 11.1: Acorus Calamus

Termite attack has been known to be controlled by the application of the decoction of *Karinjottei* (*Samadera indica*), and of *Sotrukathazhai*, Aloe vera.

Care of Manuscripts Through Rituals and Proper Storage

Annual rituals in homes and institutions involve the application of either a paste of coconut leaf juice and wood charcoal or turmeric on the manuscripts. During *Vijayadaśamī*, the Palm-leaf manuscripts are removed from their storage and bathed in the rays of either the rising sun or setting sun in order to counter insect and microbial activity.

Traditionally Palm-leaf manuscripts were kept in the kitchen lofts where the smoke from the cooking fires safeguarded them from insects and fungi. It is common practice to protect the Palm-leaf manuscripts from physical damage, dust, moisture and distortions by placing them tightly between wooden planks. Red silk or cotton cloth are considered a protection against insects and therefore the manuscripts were kept bundled in them. Cords dyed yellow with turmeric were used to avoid fungal and insect attack. Cloth was dyed red using a solution of turmeric and lime in order to protect manuscripts from insects.

Conclusion

Traditional methods of preservation of Palm-leaf manuscripts are time tested and also friendly to the environment. Generations before us have found various materials for preservation of our collections. These must now be studied for their efficacy in today's context. Many synthetic materials have today replaced the herbal remedies. Whether we use herbal or synthetically produced materials for the control of biological activities, the very same materials should never be

used continuously. The materials should be changed in order to avoid the insects developing immunity to them. Extensive research is needed to find out the contents of various herbal materials, which can control insects and fungi acting on our manuscript collections.

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Manuscript Conservation in the Śaivite Maṭhas of the Erode District of Tamil Nadu

C. MAHESWARAN

Abstract

A pilot study conducted at various Śaivite *maṭhas* of the Erode District of Tamil Nadu has revealed that for centuries the authorities of these *maṭhas* have adopted certain indigenous conservation practices, employing various indigenous materials — especially organic in nature — in their efforts to conserve the priceless treasure of the manuscripts in their custody. As these religious *maṭhas* are usually not open to the public in addition to the advent and availability of synthetic chemicals, this indigenous knowledge system has remained a secret. In this paper, the author highlights the indigenous practices of both preventive and curative methods of conservation such as fumigation and softening that are carried out periodically with locally available materials of organic origin in the 17 Śaivite *maṭhas* established in the *tāluka*s of Perundurai, Bhavani, Kangeyam and Dharampuram of the Erode District. The details of such indigenous practices and materials used can be applied in the field of conservation and cultural heritage.

Introduction

Śaivism, the cult wherein Lord Śiva is worshipped as the prime deity, flourished in the state of Tamil Nadu in the medieval period, when several *maṭhas* were established at various places in the state. While western Tamil Nadu has 51 Śaivite *maṭhas*,* the Erode District in this region is host to 17 of these Śaivite *maṭhas*. As these *maṭhas* are often inaccessible to the general public, society remained unaware of the indigenous knowledge system in existence and being practised at the *maṭhas*. In this paper, therefore, an attempt is made to highlight the indigenous practices of both preventive and curative conservation techniques that are carried out periodically with the locally available indigenous materials, especially of organic origin, in the Śaivite *maṭhas* that have been and are functioning in the *tāluka*s of Perundurai, Bhavani, Kangeyam and Dharapuram of the Erode District.

Maṭhas as Repositories and Custodial Centres of Manuscripts

These *maṭhas* served not only as religious centres but also as resource centres where varied subjects such as literature, grammar, philosophy, astrology and medicine were taught and these are documented in manuscripts, especially Palm-leaf manuscripts. These centres have tried their best to conserve the priceless treasures of Palm-leaf manuscripts in their custody, by employing indigenous materials and methods. The information that could be gathered from the seventeen Śaivite *maṭhas* of the Erode District point to a surprisingly low numbers of manuscripts in the following five *maṭhas* considered to be repositories of Palm-leaf manuscripts.

* *Maṭha* is a type of monastery belonging to a Hindu religious order. The *maṭhas* usually have a temple, administrative unit, residential facilities and also schools of religious learning.

- (i) Srilasri Sivasamaya Paṇḍita Guruswamigal Maṭha, Sivagiri (Kangeyam Tāluk) [15 bundles]
- (ii) Sivathiru Kanagagiri Paṇḍita Guruswamigal Maṭha, Pattali (Gobichettipalayam Tāluk) [3 bundles]
- (iii) Sivathiru Kodumudi Paṇḍita Guruswamigal Maṭha, Keeranoor (Dharapuram Tāluk) [2 bundles]
- (iv) Sivasri Navarathna Nayaga Paṇḍita Guruswamigal Maṭha, Bhavani (Bhavani Tāluk) [1 bundle]
- (v) Sri Manickavasaga Swamigal Thirumadaalayam, Koonampatti (Perunduri Tāluk) [yet to be enumerated]

Indigenous Conservation Practices in the Śaivite Maṭhas

In these *maṭhas*, the Palm-leaf manuscripts are stored within a characteristic cane box known as *Oalaichuvadi petti* (Lit. box of Palm-leaf manuscripts). This cane box is woven in a manner that leaves small gaps ensuring ventilation to the Palm-leaf manuscripts kept in it. The bundles of Palm-leaf manuscripts are stacked inside the box in a characteristic way to avoid overcrowding and to minimize the load of one bundle over the other. Every year during *Navarātri* celebrations the bundles of Palm-leaf manuscripts kept in the cane box are unpacked and subjected to “general cleaning.” The various steps involved in this general cleaning are the following:

- (i) Dusting with a soft cotton cloth.
- (ii) Rubbing extracts of leaves (such as of palmyra palm; coconut; ivy or gourd).
- (iii) Fumigation with frankincense fume.
- (iv) Keeping the manuscripts between boards made of teak wood and tying this assembly with turmeric-soaked

cords uniformly distributed over the boards. The bundle is then wrapped in a coarse red-coloured cloth.

- (v) These manuscripts are kept with sachets of a powdered mixture of shade-dried black cumin seeds, cinnamon, sweet flag, black pepper, cloves and green camphor.

Other than this general practice of storing the Palm-leaf manuscripts in cane boxes, those manuscripts that are referred to frequently are kept in typical wooden hangers known as *Oalai thookku* (lit. Palm-leaf hanger) or *Chuvadi thookku* (lit. manuscripts hanger).

It may be worth mentioning that during rituals, fumes of frankincense, camphor, incense sticks are present around the manuscripts as are chrysanthemum flowers and leaves of basil, and these are known to have insect-repellent properties.

Indigenous knowledge systems are often passed down successive generations. Indigenous conservation practices are usually employed without an awareness of the scientific principles involved. While these practices, especially that of the “annual general cleaning,” help in conservation of manuscripts by the use of materials essentially of vegetal origin, often the manuscripts are preserved because of good housekeeping as well as of some inherent medicinal properties of the manuscripts’ materials.

Concluding Remarks

These Śaivite *maṭhas* are keen to employ indigenous organic materials, especially of vegetal origin, to preserve their manuscripts. These indigenous practices and materials could be put into wider application in the field of conservation of cultural heritage after careful scrutiny and testing for effectiveness. As there is today a marked decline in the

employment of indigenous practices and materials in these *maṭhas*, there is need to gear up the use of our traditional systems of conservation.

Acknowledgement

The author wishes to record his deep sense of gratitude to Shri M.A. Siddique, I.A.S, Director of Museums, Government of Tamil Nadu for having permitted the author to participate and present this paper at this seminar.

Notes

1. For the complete list of the Śaivite *maṭhas* of the Erode District of Tamil Nadu, please refer to Table I.
2. For the preparation of the powdered mixture with insect-repellent properties, please refer to Table II.
3. The indigenous materials of organic origin used in the conservation of manuscripts at the Śaivite *maṭhas* of the Erode District are listed in Table III.
4. According to Sri Balamurugan Esana Sivachariyar (belonging to the Srilasri Sivasamaya Paṇḍita Guruswamigal Maṭha, Sivagiri) the workshop on Preventive Conservation of Manuscripts conducted by the INTACH ICCI Bangalore Centre under the aegis of the National Mission for Manuscripts has revived the spirit of conservation of manuscripts in their *maṭha* (Personal Communication).

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Table - I
Saivite Maṭhas of the Erode District of Tamil Nadu

Table - I			
Śaivite Maṭhas of the Erode District of Tamil Nadu			
Sl. No.	Name of Maṭha	Locality	
1.	Sivathiru Navarathna Nayaga Paṇḍita Guruswamigal Maṭha	Bhavani, Bhavani Tāluk	
2.	Sri Maanickavaasaga Swaamigal Thirumadaalayam	Koonampatti, Perundurai Tāluk	
3.	Srimadhu Aanda Subramaniya Paṇḍita Guruswamigal Maṭha	Perundurai, Perundurai Tāluk	
4.	Srimadhu Aadhi Saiva Puranthira Paṇḍita Jagathguru Swamigal Maṭha	Saathamboor, Perundurai Tāluk	
5.	Srimath Moovaendha Paṇḍita Guruswaamigal Maṭha	Vellode, Perundurai Tāluk	
6.	Sivathiru Kodumudi Paṇḍita Guruswaamigal Maṭha	Keeranoor, Perundurai Tāluk	
7.	Sivathiru Kanagagiri Paṇḍita Guruswaamigal Maṭha	Pattaali, Gobichettipalayam Tāluk	
8.	Srilasri Sivasamaya Paṇḍita Guruswaamigal Maṭha	Sivagiri, Kangeyam Tāluk	
9.	Srimadhu Maanicka Naayaga Chandhrasekara Paṇḍita Guruswaamigal Maṭha	Kodumudi, Kangeyam Tāluk	
10.	Sivathiru Meenakshi Sawa Puranthara Paṇḍita Guruswaamigal Maṭha	Kadaiyoor, Kangeyam Tāluk	
11.	Sivathiru Kulasekara Paṇḍita Guruswaamigal Maṭha	Muthoor, Kangeyam Tāluk.	
12.	Papramaeswara Paṇḍita Guruswaamigal Maṭha	Moolanoor, Kangeyam Tāluk	
13.	Sivathiru Chandhrasaekara Paṇḍita Guruswaamigal Maṭha	Vellakoil, Kangeyam Tāluk	
14.	Sivathiru Kanagasabaapathi Paṇḍita Guruswaamigal Maṭha	Valliyerachal, Kangeyam Tāluk	
15.	Srimath Aana Sivasubrahmaniya Paṇḍita Guruswaamigal Maṭha	Avalpoondurai, Kangeyam Tāluk	
16.	Sivathiru Uthama Paṇḍita Guruswaamigal Maṭha	Kangeyam, Kangeyam Tāluk	
17.	Para Para Paramaeswara Paṇḍita Guruswaamigal Maṭha	Alangiyam, Dharapuram Tāluk.	

Table II
Preparation of a Powdered Medicinal Mixture as
Disinfectant/Insecticide/Insect-Repellent

Ingredients	Quantity
Black Cumin seeds	1 Part
Cinnamon bark	1 Part
Sweet Flag	1 part
Cloves	¼ Part
Black Pepper	¼ Part
Green Camphor	25 gms

Method of Preparation of the Powder

All the above indigenous ingredients are dried in the shade and then pulverized separately, one at a time. Each powdered ingredient is then put together and mixed thoroughly. 5.0 grams of this mixture is then packed into cloth sachets of four inch dimensions. Such sachets packed with medicinal powder are kept between the bundles of Palm-leaf manuscripts and on the shelves.

Table - III

**Indigenous Materials of Organic Origin Employed in Conservation of Palm-leaf Manuscripts
at the Śaivite Mathas of the Erode District of Tamil Nadu**

Sl. No.	Common Name	Botanical Nomenclature	Part(s) used	Utility
1.	Sweet Flag	<i>Acorus calamus</i>	Rhizome	Insecticide/Insect-repellent
2.	Adhatoda	<i>Adhatoda vasica</i>	Leaves	Insecticide/Insect-repellent
3.	<i>Margosa</i>	<i>Azadirachta indica</i>	Leaves	Insecticide/Insect-repellent
4.	Ivy gourd	<i>Coccinia grandis</i>	Leaves	Softening agent / Insecticide/ Insect-repellent
5.	Cinnamon	<i>Cinnamomum zeylanicum</i>	Bark	Disinfectant
6.	Turmeric	<i>Curcuma longa</i>	Rhizome	Disinfectant
7.	Chrysanthemum	<i>Chrysanthemum cinerariaefolium</i>	Capitula of flower	Insecticide
8.	Clove	<i>Eugenia caryophyllata</i>	Flower bud	Disinfectant
9.	Black Cumin	<i>Nigella sativa</i>	Seed	Disinfectant
10.	Tobacco	<i>Nicotiana tabacum</i>	Leaves	Disinfectant/Fungicide/ Softening agent
11.	Sweet basil	<i>Ocimum basilicum</i>	Leaves	Softening agent / Insecticide/ Insect-repellent
12.	Black Pepper	<i>Piper nigrum</i>	Dried fruits	Fungicide/ Insecticide
13.	Myrobalan	<i>Terminalia chebula</i>	Dried fruits	Softening agent
14.	Khus-Khus	<i>Vetiveria zizanioides</i>	Rootlets	Packing material
15.	Palmyra palm	<i>Borassus flabellifer</i>	Leaves	Softening agent
16.	Coconut	<i>Cocos nucifera</i>	Leaves	Softening agent

Indigenous Practices and Materials for Conservation of Manuscripts in Libraries

S.K. DAS

Abstract

The Paper describes the various factors of deterioration of Birch bark, Palm-leaf and Paper manuscripts and measures to control them and describes the techniques which could be deployed for reinforcing fragile and brittle sheets by indigenous practices and materials.

Introduction

Birch barks, Palm-leaf, Paper have been used by men since very early times for writing. As a result, a number of documents and manuscripts have been produced in all parts of the world. Today all these works constitute the written heritage of mankind and are invaluable for understanding the history and evolution of each period and region. It is obligatory on our part to protect and conserve this heritage as long as possible.

Manuscript Collection of the Asiatic Society

The Asiatic Society was founded on 15th January, 1784 by Sir William Jones (1746-1799). Manuscript collection of the Society

is varied and rich, and covers most of the Indian languages and scripts as well as several Asian ones. It appears that the number of manuscripts amounts to a little over 47,000, out of which there are 1000 bundles of Palm-leaf manuscript and 4 bundles of Birch Bark and 1 volume of Parchment manuscript. The materials used for the manuscripts are clearly varied-palm and palmyra leaves, birch barks and paper of various grades.

There are manuscripts on leaves and books using vegetable dye as ink. The oldest item of this kind is a late Gupta script text on *Tantra Kubjikāmata* (Palmyra) from the seventh century CE. There are some rare treasures in the Society's collection. Some of them are *Aṣṭasahasrikā Prajñāpāramitā* (Palmyra), an illustrated Pali Buddhist text in the Newārī script of Nepal from the eleventh century CE, Emperor Shah Jahan's biography *Pādśāhnāmāh* with his autograph, and *Jamī'al-Tawārīkh* a sixteenth century illustrated manuscript relating to the history of Chenghis Khan and his descendants, the Hungarian scholar Alexander Csoma De Koros's *Sanskrit-Tibetan-English Dictionary* (1830) in his own handwriting and an illustrated Burmese *Rāmāyaṇa* and Persian *Mahābhārata*. There are some more, like a volume on astronomy(1497) in Latin, the first Bengali Grammar (1778) by N.B. Halhead, an illuminated manuscript of the *Holy Qurān* and the *Gulistān* which are said to be first copies from the original manuscript.

Condition of its Collection

On invitation, Dr. O.P. Agarwal visited the Asiatic Society, Kolkata during 1984 when the Conservation Laboratory of the Society primarily started. He reported "Due to years of neglect and negligence, this most precious collection is today in a pathetic state."

Causes of Deterioration

The cause of deterioration was not only neglect and negligence; there were other factors (external and internal) also which damaged such materials. They are dust, light, heat, humidity, acidity, gaseous, pollution, insects, fungus, rough handling and improper storage. Paper, Palm-leaf and birch bark are perishable materials. They can be torn out, burnt, water damaged, stained by dust and dirt; attacked by biological and micro logical agents. The deterioration is more in libraries and archives of tropical countries due to climate changes, insects and pests etc.

Preventive Measures Taken by the Society

Prevention is better than cure. So regular cleaning of manuscripts by soft brush and vaccum cleaner, wrapping of Manuscripts bundle by acid free handmade paper and red salu (cloth), to save them from dust and insects, is being done in the Society. The light in its ultraviolet range has high energy to deteriorate cellulose fibers by photo oxidation. It fades works of art. In this case a project has been taken by the society to use reflected light. Heat causes brittleness. Excessive heat beyond 32 C speeds up processes of degradation, discoloration and the evaporation of the natural oil present in Palm-leaf and birch bark causing loss of flexibility. Humidity beyond 70% permits moulds to grow and flourish. It causes paper to swell and pigment layer to peel off. So temperature 22° C to 24° C and relative humidity at 55% to 60% have been controlled by 24 hours air conditioning system in the stack area of the Society. It is advisable that if an air-conditioning system is not available in any Library then chemicals like Silica Gel or Calcium Chloride (2-3 Kilograms for a room of 20-25 Cubic metre space capacity) is the best answer in moist climatic conditions and damp buildings. Circulation of air in the stack

area is essential to eliminate pockets of stagnant air, which encourages growth of micro-organisms and other injurious pests.

Prevention Measures Currently in Use by the Asiatic Society

There are so many biological agents which deteriorate the organic materials like paper and Palm-leaf. But Birch bark is generally not affected by insects except termites. Insects may be classified in two groups viz. surface feeder and inside feeder. Silverfish, cockroaches, book lice, crickets and termites, Termites are surface feeders and cause extensive damage to manuscripts. They are controlled by spraying of "PIP" insecticide (liquid and readymade, turpentine oil and 2% Pyrethrum mixed). Naphthalene bricks are also used as insect repellants. Some of the safe insect repellants are: Neem leaf dried in a special way, Red Sandal wood and Tobacco leaves. Book worms in manuscripts are controlled by putting them in the fumigation chamber for at least twenty one days and the dose is five kilograms P.D.B/ 1000 cubic feet space. At present Ethoxide gas is used in the vacuum Fumigation chamber for complete sterilization of insect infested volumes in the Asiatic Society, Kolkata. Future programmes involve the installation of a freeze dryer, for complete eradication of insects without using any insecticide which is harmful to human beings.

Menace caused by rats/mice can be effectively controlled by poisoning and trapping. Poisons are always used with baits which are spread over places frequented by rats/mice. Dry bread and cheese have been quite effective as a bait base. Some of the good rat poisons are Zinc Phosphide (3-5%) and Arsenic Oxide (10-15%). The best way is to use baits in traps.

Fungus or mildew infested manuscripts may be treated by fumigating in a Thymol fumigation chamber. The doze used

is 1 ox/16 cubic feet space for 12-14 days. A 40 watt bulb is required to melt and evaporate the Thymol in the fumigation chamber otherwise fungus affected areas can be sprayed with 5% Thymol in Methyl alcohol.

Accidental Causes of Deterioration

There are so many accidental causes to deteriorate the Manuscripts such as flood, fire, leakage of roof, busting of drainage pipes etc. Fire is also a greatest accidental agent which damages Library materials in a very short time. It is, therefore, imperative that precaution and prevention against fire must be taken. Inflammable products should be stored outside the library building. The Carbon dioxide fire extinguishers must be kept in conspicuous place. The drainage pipes should be regularly inspected for blockage or leakage. Flood and other natural agents deteriorate the paper and other library materials. In such a situation, manuscripts should be removed to drier surroundings where humidity can be controlled.

Documentation Before Treatment

Before the treatment of manuscripts the following documents are necessary:

1. Photography before and after treatment.
2. Preparation of history sheet;

These sheets are used as record of information collected from manuscripts when they are received for treatment. Before starting the treatment, the physical conditions of the manuscripts as apparently visible is recorded on the same sheet.

3. Proposed treatment i.e. methods and materials should be recorded before treatment.

De-acidification

Acidity does not affect the Palm-leaf and birch bark manuscripts to the same extent as it harms the paper manuscripts. Paper becomes acidic from a number of different causes such as acid from polluted atmosphere, acid sizing like alum, acid pigments like Verdigris and inks specially Iron Gall ink. Acidity causes loss of strength by hydrolysis of cellulose molecules. So de-acidification is essential for neutralization of acid. De-acidification does not strengthen paper but it stops further deterioration by acid hydrolysis. There are three types of de-acidification which are maintained by the Conservation Laboratory of the Society such as:

- i) Aqueous method
- ii) Non aqueous method
- iii) Gaseous method

Before de-acidification of paper manuscripts, we test the ink, whether it is water soluble or not. If ink is soluble in water then we adopt non-aqueous method for de-acidification of manuscripts. 2% solution of $\text{Ba}(\text{OH})_2 \cdot 8\text{H}_2\text{O}$ in methanol is applied on the sheets of manuscript with a brush or a spray. Sometimes we de-acidify the manuscripts in the Ammonia de-acidification chamber using Ammonia and water, the proportion being 1:10 and the time required is 4-5 hours. After exposure in Ammonia fumes, the manuscripts should be exposed in fresh air for 12-14 hours to dispel excess Ammonia. But this process is transitory.

The Curative Measures of Brittle and Fragile Paper Manuscripts are Mending, Repair, Lamination, Encapsulation etc.

There are various techniques of restoration, both conventional and modern. Method of restoration depends on likely use of

the document. Restoration always aims at maintaining the originality of the document. Following is a brief discussion about the types of restoration in vogue, today:

- (a) *Full Pasting*: Brittle documents/Manuscripts, which are written on one side, may be strengthened by pasting a rag acid free handmade paper at the back using Dextrine or *Maidā* paste or CMC paste. The size of the paper for full pasting should be slightly larger than the size of the document to be pasted over. After the paste has dried, the oversize hand made paper is trimmed with a pair of hand scissors to the size of the document keeping a margin of 2-3 mm all around to safeguard the edges of the document when in use.
- (b) *Tissue Repair*: Toned sheets of any documents/manuscripts on which writings have not faded but show only slight deterioration can be reinforced with Tissue paper by using CMC paste or dextrin paste.
- (c) *Chiffon Repair*: Chiffon or fine transparent silk gauze is used for repairing extremely fragile ink corroded or insect damaged documents/manuscripts. Before undertaking repair with Chiffon, all the patches pasted on the document/manuscript should be removed. Dextrine paste is used in the process.
- (d) *Sizing*: The slightly brittle portions can be put back to work by using gelatin, methyl methacrylate, paralite, methyl cellulose etc. in presence of water.
- (e) *Lamination*: Manuscripts which have lost strength due to Bio-chemical deterioration can be strengthened by lamination. This process should be applied after de-acidification of manuscripts.

Solvent lamination is the best method of lamination, which can be done with lens tissue paper, cellulose Acetate Film and acetone. But imported tissue paper and cellulose acetate film are costly foreign materials and sometimes these are not available easily. It is not possible for a small library to procure and use these materials for restoration of manuscripts. It is, therefore, suggested to adopt chiffon and country made tissue paper (free from acid, waxy and oily constituents) for lamination and polyester film for encapsulation of manuscript. The polyester film is cheap and easily available in the market.

- (f) *Encapsulation*: The document or manuscript in this process can easily be encapsulated with the help of Polyester film without using any chemical or heat and pressure. It can easily be handled and is completely reversible in nature without disturbing the document or manuscript. The manuscripts may be sealed with the help of double sided adhesive tape or using high frequency ultrasonic welding machine to avoid atmospheric pollution and the bio-deterioration and also imparts strength to the document.

Restoration of Palm-leaf Manuscript

Two types of Palm-leaf manuscripts are seen in libraries (i) *Tāla* (ii) *śrītāla*. Tala Palm-leaf is thick and coarse, written on by a metallic stylus using charcoal dust for distinct writing. *Śrītāla* Palm-leaf is thin, flexible like paper and written on by carbon ink with a reed pen. Insects easily attack both the palm leaves. Their excreta jam the Palm-leaf manuscript bundle. Due to prolonged fluctuation of relative humidity and temperature, the Palm-leaf manuscripts loose their natural oil and the leaves

become brittle and fragile. To lubricate them and retain the flexibility, we use citronella oil on both the sides of each Palm-leaf manuscripts. Cintronella oil also acts as insect repellent. Broken portions may be repaired using extra Palm-leaf with fevicol. Treated Palm-leaf manuscripts can be encapsulated by polyester film or it may be strengthened by Chiffon lamination.

Restoration of Birch Bark Manuscripts

Birch bark is an inner layer of Birch tree and it is composed of several layers with natural gum and woody knots. As is naturally salted i.e. salt of salicylic acid is present there, insects do not attack it. It has natural stain so it cannot be bleached. It is available in 3 × 4 size and of Himalayan origin and is still available in Kashmir. Carbon ink is used for writing on it.

After a considerable time the natural gum loose their adherence and the layers get separated. Separated layers can be fixed using 2-3% CMC paste or thin *maidā* paste by fine brush. After joining the separated portions, it may be lubricated by using citronella oil on both sides of the Birch bark manuscript. After that the Birch bark sheet can be encapsulated by using polyester films and it can be handled easily.

Air-condition: Ideal air condition system reduces the Bio-chemical deterioration.

Manuscripts on paper decay continuously under normal temperature & humidity. Lowering of temperature slows down the chemical activity and thus reduces the rate of decay of the materials. Manuscripts stored in an air conditioned system at 55% RH and 22° C temperature with incoming air filtered off the acidic gases and dust, will difficult to maintain the manuscripts for more than a few centuries.

Conclusion

It is well known that regarding preservation of documents, manuscripts etc. rapid developments are taking place in Western Countries. India is a tropical country. Its conservation problems of Library materials are more critical than that of Western countries. In spite of that, India is also gradually moving ahead in the field of conservation work by indigenous practices and materials.

Hence the Conservation Laboratory Division of the Asiatic Society, Kolkata is in progress in the same field through its various performances of conservation work. In day-to-day preservation work, different types of new methods, modern techniques etc. which have already been adopted by few pioneer institutions. like the National Archives of India, National Museum in New Delhi, NRLC and INTACH in Lucknow are regularly followed by the Asiatic Society, Kolkata. Today hopefully, the said pioneer institutions will give us some guidelines on indigenous practices and materials for conservation of manuscripts in the libraries in India.

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Palm-leaf Manuscripts and Indigenous Conservation Practices and Material Used at the Saraswati Mahal Library, Thanjavur

P. PERUMAL

Abstract

This paper deals with the indigenous practices and materials used in the Saraswati Mahal Library in Thanjavur. The Library has more than 25,000 Palm-leaf Manuscripts and 24,000 paper manuscripts. This paper deals with the various techniques employed by the library to preserve these manuscripts.

Introduction

We find a large number of Palm-leaf manuscripts in various Indian libraries today. The Saraswati Mahal Library at Thanjavur in Tamil Nadu has more than 25,000 Palm-leaf manuscripts and 24,000 paper manuscripts. The leaves of palm-trees were used as a writing material because palm trees grew abundantly in India and South Asian countries and were the cheapest and the most easily available material that could be used as a writing support. Palm leaves, if well treated and carefully maintained have a reasonably long life even in hot

and humid tropical regions where the climatic conditions generally have an adverse effect on their durability. It has been observed that it is difficult to preserve Palm-leaf manuscripts for more than 500 years unless we have devices to control temperature and humidity and protect the manuscripts from insects.

Types of Palm Leaves

Though there are various types of palm trees, only the leaves of the following three types were used commonly for purposes of writing:

- (i) *Corypha Umbraculifera*
- (ii) *Borassus flabellifer*
- (iii) *Corypha Utan*

The palm tree *Corypha umbraculifera* is known as Śrītāla or *Talipot*, and it grows in the humid coastal areas of South India, Ceylon, Malaysia, Andaman and Thailand. It is also called *Talapana*, *Coondalpana* or *Talipanai*. The leaves are broad and long, the surface is smooth and thin and these leaves are more flexible than the leaves of the other types. *Borassus flabellifer* is known as *Palmyra* and it grows in a climate that is comparatively dry. The *Palmyra* flourishes in South India and its leaves are thick and are not longer than two feet. The third variety is *Corypha Utan*, known as *Lontar*, and it thrives in Burma and Thailand. Its leaves have a blend of the *Talipot* and *Palmyra* palm leaves. The *Lontar* leaves are long, broad and thick and most of the Burmese manuscripts were written on these leaves.

Writing on Palm Leaves

For writing on palm leaves, five-to-six-month old leaves are collected, separated by cutting away the mid rib and dried in

the shade. After drying, the leaves are cut into a convenient length for writing and the surfaces are burnished. Two small holes are made for passing the cord to tie the bundle of leaves. The holes are placed in such a way that they divide the leaves more or less in three equal parts. Writing on palm leaves is done in the following manner:

- (i) One method is to inscribe on the leaves with a stylus;
- (ii) The other method is to write with ink on leaves using a bamboo pen or brush. For incising the writing, palm leaves have to be processed to soften the surface of the leaves before a stylus is applied on them. The stylus or *śalākā* made up of iron, steel, brass, with a pointed tip and sometimes embellished with bone and ivory is used for writing. One type of metal stylus has the pointed tip at one end and a sharp knife on the other end.

When incising the writing, the seasoned leaves are supported on a rigid surface or on the fingers of the left hand while incisions are made using the right hand to hold the stylus which rests on the thumb of the left hand for support and to prevent it from slipping. The incised leaves are given a two fold treatment for assuring the clarity of script. Turmeric paste is applied on the surface of the leaves of the manuscripts that are sacred and therefore kept in puja, worship. A mixture of vegetable juice of *Kovai Elai* (*Cocina indica*) and lamp soot prepared using castor oil was applied for rendering the incised writing clear. Nowadays lamp soot mixed with some volatile oils like Citronella is used for this purpose. In North India the palm leaves have been written with ink by using pens or soft brushes as the North Indian scripts are angular and such incisions would tear the leaf.

The Palm-leaf bundle

After writing, to avoid damage by insects, the leaves are arranged, strung and then placed between two planks of mango, bamboo, or teakwood. To hold the manuscript in position, the end of the cord that runs over the manuscript bundle to bind it in place is fastened to a device made of a Palm-leaf piece with the mid rib intact and it resembles the beak of a parrot. If the manuscript has more than two hundred folios, when the cord cannot hold them easily without damaging them, a small rod of copper or bamboo called *Nārasam* is pierced into the other hole of the manuscript bundle to hold the leaves in place. Other than wooden boxes, manuscripts were stored on a plank of wood called *Thooku* that was hung in the kitchens. Earthen urns with covers or bamboo cases with covers were also used to store manuscripts.

Preservation Techniques

From ancient times several indigenous materials were used for preservation. The people were aware of the four basic factors leading to deterioration, namely, dust accumulation, direct sunlight, heat and humidity. To overcome these problems, manuscripts were usually covered with red coloured silk or cotton cloth which offered some protection from dust, light, heat and humidity. Red coloured cloth was used as it by its very colour acted as a repellent to insects and perhaps this also explains why red lines were drawn in front of the houses in the winter months, to prevent insects from crawling into homes. This is possibly the reason why the spines of books were bound with red coloured cloth or leather in most of the Indian libraries. Since turmeric has germicidal properties, paste or water treated with it was applied to the

leaves to prevent fungal attack. Most of the manuscripts in the Saraswati Mahal Library have been treated with turmeric paste too. Plants like *kovai* that have been used for inking the text of manuscripts are bitter and are endowed with insect repellent qualities. The inking in addition also seals the stylus engraved manuscript surface from absorbing moisture. In practice it is found that the unblackened (uninked) manuscripts are destroyed faster than the inked manuscripts.

The Saraswati Mahal Insect Repellent Formulation

Many local materials like dried *Margosa* leaves, tobacco, camphor, black cumin, sweet flag, snake slough and peacock feathers have been used as insect repellents. The Thanjavur Maharaja Serfoji's Sarasvati Mahal Library at Thanjavur uses a mixture of the following spices in the powdered form to protect its manuscripts from insect attack. This formulation has been mentioned in the indent book of the librarian, Kuppa Bhatta, who served in this Library in 1882.

Black cumin	4 parts (1 kg)
Sweet flag	4 parts (1 kg)
Cloves	1 part (¼ kg)
Pepper	1 part (¼ kg)
Bark of cinnamon	4 parts (1 kg)
Camphor	(20 grams)

This powdered mixture is wrapped in a small cloth and such bundles are kept in the cupboards as insect repellent. This mixture is effective for six months, after which it has to be replaced with a freshly prepared mixture.

The administrative report of this Library published in 1921-22 mentions the preservation activities in the following manner:

"The disinfectant vegetable mixture made in the Library is being applied to Palm-leaf manuscripts. The mixture makes the writing clearly visible and also strengthens the leaves. According to the recipe, found in the old records of the Library, of the disinfectant powder, the vegetable extracts are purchased; dried and small quantities of it are tied up in cloth and placed in the books and manuscript shelves. About 550 such packets have been made and kept in the shelves."

It is also mentioned that the manuscripts were dusted, cleaned and exposed in the shade to light and air. Use of the juice of the *Datura* leaves, and placing of dried *Margosa* leaves between adjacent manuscripts and books was prevalent. Citronella oil has also been used for Palm-leaf preservation from 1922-23. Because of the continuous steps taken for the preservation of manuscripts and books, the collection of this Library is in a good condition. If the good health of the manuscripts in the Sarasvati Mahal Library is an indication of the benefits of using indigenous preservation materials, then it might be important to scientifically analyze the local materials for their efficacy in a large scale conservation of manuscripts.

Interventions

Anupam Sah: What wood do you suggest to make boards to keep manuscripts in place?

Mr. P. Perumal: In Tamil Nadu we use seasoned teak, jackfruit wood



Fig. 14.1: Ingredients used in the insect repellent formula at the Saraswathi Mahal Library

Anupam Sah: Your paper is based on the composition that has four-five ingredients. Is it being used in this form because the ingredients have been traditionally used or is it based on your own studies and tests?

Mr. P. Perumal: No, we have not tested the efficacy of any ingredient. We are using the components because this mixture was prescribed. We did not question it. I do think, however, that just the component Sweet flag (*Acorus Calamus*) would be enough. There is need for researching this composition itself.

The Manuscripts of the Tawang Monastery

MALTESH MOTE BENNUR and NAWANG PHUNTSO

Abstract

This paper presents a brief history of the region near Tawang, the monastery and its library. The paper then introduces the manuscript collection and the indigenous method of the preparation of the paper. The objective of this article is to raise interest so as to bring about a conservation of the collection as well as a revival of the traditional paper making techniques amongst the Monpa and Sherdukpen tribes of Tawang and West Kameng districts of Arunachal Pradesh.

Introduction

The Tawang Monastery is one of the largest Buddhist monasteries in Asia and is located in Arunachal Pradesh in India. On the request of Mr. Anupam Sah, who had earlier rushed to the Monastery with an architect colleague Mr. Janhwij Sharma, to convince the monks not to demolish their wooden library for a cement concrete structure, a visit was made to this region to identify persons who could still make the traditional paper using the indigenous techniques. At the same time, the manuscript collection of the Tawang Monastery was

examined. This paper introduces the monastery, the collection and the method of preparing local handmade paper.

Arunachal Pradesh

From where the mountains rise stretching northwards from the plains of Assam to the boundaries with China, lies India's farthest North-Eastern State of Arunachal Pradesh. Once referred to as the North East Frontier Agency (NEFA), Arunachal Pradesh is the largest among what is grouped as the Seven North-Eastern States or "The Seven Sisters." It is a vast land, austere and lovely, covering an area of 83,743 square kilometres and straddling the Eastern Himalaya like an intervening belt of green shadowed in perpetual rain and mist. From its meeting point with Bhutan in the West, the State stretches 1,030 kilometers eastwards descending from the northern boundary into the thickly forested slopes of the Patkoi hills, thus forming a triangular border with Bhutan, China and Myanmar. The area's remote geographical location, its inhospitable terrain, and the reported ferocity of its people left it outside the sphere of early explorations and evoked a very mixed reaction from those who first encountered it. The state is home to twenty five major tribes spread across 3,649 villages, most of which are located in remote valleys and hilltops.

As with most places in the mountains, though life is harsh, there is a measure of security. This remote Frontier State has now to catch up with the rest of the world, conforming to the new rules of change that are sweeping the land. Tribal society in the deep interiors is not entirely as picturesque as we like to imagine it. Even though one has to struggle in order to survive, the locals have established for themselves a way of life that is in harmony with the environment that surrounds them.

The Road to Tawang

Following the road to the district headquarters of Bomdila, one is struck by the air of worship and prayer. A pathway is lined with prayer flags that flutter in the cold, clear air. These are the tall *Ganzen Tsemo Lungdar*, with the emblem of the wisdom sword and the crown of sun and moon suspended over the eternal wheel. Following the Tibetan calendar, these are erected after the completion of every twelve-year cycle. A *Rimpoche*, reincarnate lama, is consulted and according to the year of birth, a particular mantra and type of flag is prescribed. The main flag is colour coded according to the corresponding zodiac sign, and to these are attached strips of cloth. The colour blue corresponds with the sky and water, white stands for clouds, red for fire, green for living things, trees, plants and yellow for the earth.

Among the Monpa and Sherdukpen tribes of Tawang and West Kameng districts, Lupon Rimpoche is the local name for the Indian monk, Padmasambhava, who is believed to have established Buddhism in this area sometime in the eighth century. The West Kameng region of Arunachal is devoutly Buddhist and daily life is closely interwoven with religious practices. Among the Monpa and Shredukpen tribes there are seven and nine places respectively hallowed by the visit of Padmasambhava. These are places where the great master is believed to have sat in meditation and the impressions that he has left of his presence are revered and cherished to this day.

Beyond the soft rain and mist of Bomdila, on the road to Tawang lies the fortress town of Dirang-Dzong. The old fort is a four storeyed structure that was built in 1831 to function as an administrative centre under the direct control of Tawang monastery. A senior monk called a *Dzongpen* whose main duty

was to collect taxes for the monastery was deputed to run it. Legend has it that the construction of the fort was fiercely resisted by the men of twelve leading households of this village that opposed the authority of the Tawang monastery being imposed on the freedom of the people of Dirang. In the ensuing armed struggle all the twelve men were brutally killed. Today, the fort stands in the old village as silent testimony to the brave men who fought for the freedom of the Monpas of Dirang village that still practices the pre-Buddhist Bon religion and perform rituals of the older Nyingmapa Buddhist sect.

The Tawang Monastery

According to local legend, more than four hundred years ago, a great monk, Lodre Gyatso, or Mera Lama as he is popularly known, travelled to this area in search of a site for a new monastery as a centre for the reformist "Yellow Hat" or Gelugpa sect of Mahayana Buddhism. He sat down on a hill to pray for guidance and when he looked around again he found that his horse had wandered off. Following the horse's hoof prints, Mera Lama came upon the palace of one of the local kings, Gyalpo Kala Wangbu. He at once perceived this as a divine sign that this was to be the chosen site. In another version, the horse, on reaching the present site of the monastery refused to go any further and instead began to strike the earth with his hoof. In recognition of the part played by the horse that led him to the site, Mera Lama called the chosen place "Ta-Wang," (Ta-horse, Wang-chosen). The full name of the monastery is Tawang Ganzen Namgye Lhacheh, which translates as "The celestial paradise of the divine site chosen by a horse."

The Library Collection

The library of the Tawang Monastery is a wood and stone structure and is known as the *Par-khang* or the *La-khang*. The manuscripts are stored on the first floor. Each manuscript is carefully wrapped in cloth, placed between wooden boards and then each bundle is placed in long pigeon-hole shaped wooden storage along the walls. The monk custodians treat the manuscripts with reverence.

Kan-gyur: In the Tawang monastery library, there is one set of 200 volumes of hand written *Kan-gyur* written after the establishment of Tawang monastery. Another set of 200 volumes of *Kan-gyur* written in gold and silver inks is also available in the monastery and these were written in Tibet much before the establishment of the Tawang Monastery.

At the Tawang monastery the *Kan-gyur* is read twice a year, once during the winter and once again during summer, to seek the blessings of Buddha, to ward off evil, for good luck, to secure a good harvest and for keeping away diseases. Other than at the monastery, individuals also read the *Kan-gyur* in their respective villages. Besides the above manuscripts, there are many other documents related to Buddhist studies not just in the Tawang monastery but also in its branch *gompas* and other village *gompas*.

Ten-gyur: There are about 300 volumes of *Ten-gyur* in the library.

The Manuscripts

The *Ten-gyur* manuscripts are mainly the teachings of scholars, disciples and *ācāryas** like Asank, Baru Bandhu,

* Teacher.

Dig Nag, Acharya Tsonkhpa of Tibet and others. The *Ten-gyur* is read in the Tawang monastery when there are natural calamities like flood, drought, epidemic diseases, earthquake, heavy snowfall etc. The *Kan-gyur* scripts are the teachings of the Buddha and contain more than a hundred volumes with each volume containing 400-500 pages. Some of the volumes of the *Kan-gyur* are *Bum*, *Nyiti*, *Gyetong*, *Choido*, *Felchin*, *Kontsek*, *Gyui*, *Nyangdey*, *Zungdui* and *Dulwa*.

The manuscripts are written in the Bhodi alphabets whose development is attributed to Thonmi Sanpota, Personal Secretary to the King Songtsen Gombu, the first Dalai Lama of Tibet. He wrote in a number of religious Buddhist scripts, *Pecha*, and documented the teachings of Buddha and of other *ācārya*.

Paper Making Techniques

Many of the manuscripts are written and block printed on paper made from the fibres of a local shrub *shugu-sheng*, of the *Rhaphnus* species, that grows in the Mon region of Tawang and West Kameng Districts of Arunachal Pradesh as well as in the Tsang area in Tibet. This local hand-made paper is still produced in the Mukto area of Tawang District. This paper, unlike other factory produced paper, is tough and does not get damaged easily.

For writing the scripts on local paper, inks are known to have been imported from *Gyana* (China). A type of ink was then produced in the Mon area too. The Monpa people burnt Pinewood and collected the soot on the inner surface of an earthen pot. The soot was mixed with castor sugar or *miśrī*, plant gum, deep roasted barley and water. This mixture is

thoroughly mixed and kept for at least for a week before it is used.

For writing with this ink, a simple type of pen made from *sik*, a small species of bamboo found in Rahung areas of West Kameng District and Tawang was used by dipping into the ink. For writing on the local handmade paper, three to five sheets of such papers were pasted together with the help of local plant gum, animal *Klih* from the Gall Bladder of animals and also wild spice, *Yerr*. The purpose of using the bitter *Klih* was to protect the manuscripts from attack of insects and fungus. The ink is also fast and does not easily get damaged with moisture. It takes a scribe one day to write a page of the size 70 cm by 15 cm. Other than the black ink, texts are also written using gold, silver and other colours that were made with pigments brought in from nearby Bhutan. In the present day, modern paints are being used for writing manuscripts. Some traditional scribes are still present in and around Tawang District. One of these scribes is Shri Lungten residing in Shyo village.

Concluding Remarks

The monastery collection has had its share of problems related to the conservation of the manuscripts. Other than damage by the elements, there have been reported instances of removal of some ritual articles and manuscripts. It is time that thought is given to save and revive traditional monastic values as well as the related collections. The Tawang Monastery being out of the way for most institutions and individuals is a challenge for those who really wish to conserve its heritage.

Interventions

Vipul Shah: In Nepal and Bhutan, on the pretext of “reviving” this skill of paper making, the local paper makers are being forced to use caustic soda. The traditional method is to pass water through wood ash to produce a mild alkaline solution. What is the status there in Tawang?

Maltesh M.: No, here the few paper makers that are there still use the traditional method of passing water through wood ash and no synthetic chemical is used.

Vipul Shah: Does the ink spread? Do they size the paper or use orpiment on it?

Maltesh M.: No the ink does not spread. I suppose using the wood ash solution provides the sizing to the paper. No orpiment is used on it either.

Ratna Basu: What is the ink made of? Sometimes gall bladder is used to make ink.

Maltesh M.: Pine wood is burnt, the soot is collected. It is then mixed with *miśrī*, castor sugar, burnt barley and then kept for a week. Water is then added to it along with the gall bladder of a bovine. The gall bladder, the bile helps to protect the inked portions of the manuscript from insect attack.

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Manuscript Conservation Methods Employed at the Rampur Raza Library

W.H. SIDDIQUI

Abstract

The paper examines the development of writing and the spread of libraries in the Islamic world. It then explains the various methods by which the manuscripts in the Rampur Raza library, one of the major libraries of Islamic collections, have been taken care of since its establishment in 1774.

Introduction

There has been awareness about the storage and preservation of manuscripts and books from the very beginning, at least since setting up of libraries started in the Islamic countries. Before the discovery of paper making, books and records were written on stone, terracotta plaques, bark of trees, palm leaves, animal bones and skins. Except for relatively permanent materials like stone and terracotta, all other materials that were used for writing were perishable, and hence, very few specimens of such materials have survived. Those that have survived are in a very bad state of preservation and they require priority treatment.

It is surprising that Islamic scholars who had written lakhs of books, treatises and research papers on different subjects such as History, Geography, Religion, Biographies, Chemistry, Physics, Geology, Zoology, Botany, Medicine, Astronomy, Astrology, Mathematics, Algebra and Geometry, have only casually referred to the early Islamic libraries and their collections. Moreover, they have not recorded how the manuscripts were looked after and what methods were adopted for their preservation. Some awareness, however, can be observed when we find mention of how the librarians used to keep the manuscripts in wooden and iron boxes and later in wooden almirahs. I may briefly mention some of the ancient Islamic libraries and their history.

Development of Writing

The Arabs had developed writing before the advent of Islam. There were seventeen persons in Qurais who knew the art of writing. A few women also practiced writing. The Jews had already learnt the art of writing at Medina before the birth of the Prophet Muhammad.¹ They used to write on stone and animal skin. The necessity of reading and writing was emphasized in the *Qurān* for copying the message of God. Side by side, the sayings of the Prophet (*Ḥadīth*) were also written on the bark of trees, bones and animal skins.² During the days of the Prophet there were writings like the Arabic version of *Qurān*, the letters of the Prophet, didactical poems in praise of the Prophet and certain written agreements between Muslims, Jewish and Christian kings.

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1. Hafiz Ahmed Ali Khan Shauq, *Tārīkh-i-kitāb Khānah-i Razā*, ed. W.H. Siddiqui, Rampur, 1998, p. 44.
 2. Hafiz Ahmed Ali Khan Shauq, *Khātimah Futūḥ al-Buldān-i Balazari*.

Spread of Libraries

Though there have been no separate chapters in history books of the Arabs on libraries, with the extension of Islamic influence and establishment of new States, the writings and collection of books became very popular.³ The Caliph Mansūr of Baghdad got hundreds of books of Latin and Sanskrit translated in Arabic. Caliph Hārūn Raśīd established a great institution of research and translation, which he named *Bait'ul Hikmat*. It had two sections, one of which housed the library and the other was the bureau of translation from different languages such as Sanskrit, Persian, and Latin etc. Yaḥyā, the Minister of the Caliphate invited great *Pandits* from India and appointed them for translation work. Caliph Mamun also followed the same path. Ibn Abil Jāriś was the binder of the *Kutub Khānah* (Library) of Māmūn,⁴ which later became a popular interest of the ministers and noblemen who then began to establish their own libraries. Muhammad Abd al Malik Zayāt, the Minister of Wāthiq Billāh, used to spend Rupees 10,000 per month on translation of books.⁵

There were four lakh volumes in the library of Hākim Mustansir (d. AH 332 / CE 943-944), the Caliph of Andlas (Spain) and he had appointed his agents for purchasing books, i.e. manuscripts from Spain, Syria, Egypt, Persia and Khurasan. The library of Nūḥ bin Mansūr, King of Bukhārā, was very famous. About it Avicenna wrote that the books on philosophy seen by him in that library were not found in other libraries. He described the library as a big house in which there were

3. Hafiz Ahmed Ali Khan Shauq, op. cit., p. 48.

4. Rasacil Maulana Shibli Shauq, op. cit., p. 48.

5. Ibid.

several rooms and every room housed books on various subjects including science. There were several large wooden boxes in which books were kept on top of each other.⁶

Azadu'd-Daula Delmi had also established one very impressive and big library. The building of the library was very large and had many rooms and every room had almirahs standing by the walls and every almirah was three yard wide and as tall as a human and was decorated in golden designs. There were separate rooms for particular subjects, with distinct list of books.⁷ The Library of the Fatmid king of Egypt was exceptional and it had no equal elsewhere. It was housed in the royal palace and had forty separate apartments with books on different subjects and there were eighteen thousand books on philosophy. The specimens of celebrated scribes namely Abū Muqla and Ibn al-Bawwāb were also preserved in the wooden boxes.⁸ All these libraries belonged to kings and ordinary persons could not benefit from them. However, it was Sāpūr bin Ardsīr who established one *Dār al-'Ulūm* in AH 382 / CE 992, and bequeathed many books for the use of the general public. In AH 395 / CE 1004-1005, the Fatmid king Bin Amīr Allāh established a king's library in Egypt, for the use of the general public where copying of books was allowed and paper, pen and inkpots were provided to scholars free of cost.⁹ With this, libraries began to be built for every *madrasah* and mosque. Eventually, a large number of *madrasas* and libraries were established by the Sultans and Mughals in India.

6. Rasacil Maulana Shibli Shauq, op. cit., p. 50.

7. Ibid.

8. Ibid.

9. Ibid.

Care of Manuscripts and Books in the Rampur Raza Library, Rampur

The Rampur Raza Library was established at Rampur in CE 1774-1775. The books were very carefully kept in wooden almirahs and were periodically verified by the emperors, noblemen and *kitābdārs* (librarians) as is evidenced from their seals and autographs on the overleaf of manuscripts. Besides the *darugāh* (superintendent) of libraries, there were large numbers of employees who took care of books and adopted indigenous methods of preservation including good practices such as those of cleaning the manuscripts regularly. Particular manuscripts such as that of the *Holy Qurān*, were kept in *Juzdān* or stitched silken or cotton cloth. The manuscripts were and are still are kept at the Raza Library in airtight iron almirahs which were specially designed and manufactured by Godrej in the twenties. There were *Waraq gardans* (dusters) who used to look after every folio of the manuscript and clean it with a soft white cloth. During the period of the existence of the Nawabi State of Rampur, the Raza Library had more than fifteen *Waraq gardans* whose task was to clean the manuscripts and books regularly. A few of them are still working at the Raza Library. The manuscripts and books were dried in the sun if moisture was noticed in the almirahs.

The manuscripts and books were taken out from the almirahs and kept on clean carpets and the attendants cleaned the folios of the manuscripts and pages of books from morning till evening. The manuscripts and books which were found to be attacked by insects were manually cleaned and exposed to the sun for removing the insects. The manuscripts and books that were infested by insects were kept away in separate almirahs for protecting the remaining manuscripts and books. Brittle and damaged manuscripts and books were handed

over to the menders and book binders for proper repair and binding. By this process the manuscripts and books were saved from dust, insects and damages. It is because of this regular care that a large number of old books have survived for centuries and have come down to us.

For the safety of manuscripts and books, besides peacock feathers and snake skins, dried neem leaves were also kept in the folios of the manuscripts. Later pieces of alum also began to be placed in the almirahs for the safety of manuscripts and books. In Rampur Raza Library there were proper arrangements for repairing damaged manuscripts and books. The menders repaired the damaged margins by pasting suitable papers. Repairs were also made in patches on the main text of the manuscripts by pasting transparent thin paper with paste specially made for the purpose. Damaged folios were removed from their “windows” and pasted on separate paper as is evidenced from the rare manuscript of *Dīwān-i Bābur* written in Turkish language. Illustrated manuscripts were also repaired with special thin papers and saved from further damage. The pasting material (*leṭ*) was prepared using *maidā*, mixed with powder of copper sulphate and mixture of alum. *Maidā* was mixed in water, and then the powder of copper sulphate was added into the pot and put on the fire. The solution was stirred by a wooden spoon for some time till the paste was prepared. Later the use of copper sulphate was stopped and alum was used for better pasting without the onset of yellow patches.

Continuation of the Conservation Tradition

There has been a separate binding section in the Rampur Raza Library for more than a hundred years, which has always repaired damaged bindings and also provided new bindings

when required. If the leather of the binding was damaged it was removed and healthy leather was used for this purpose. The old system of preservation and binding of manuscripts and books in the Rampur Raza Library continued until 1995 when a Conservation Laboratory was established in the Library and scientific conservation work started. The Rampur Raza Library continues its tradition of taking care of its exquisite collections.



Paper Making at Sāṅgāner Changes Over Time

RITU JAIN

Abstract

Sāṅgāner has been a centre of paper-making for centuries. Over the years, however, the quality of paper has changed and the number of families involved in the craft has decreased. This paper traces the changes that have taken place in its way of making.

THE very topic of the seminar reminds us of the extraordinary statement given by a great literary master:

I have traveled the world twice,
Met famous saints and sinners,
The old stars and the hopeful beginners,
The kings and the queens,
The writers and the poets,
The maters and the cooks,
All in one library ticket,
In the wonderful world of books.

Who will deny the universality of this wonderful statement! We all agree to this. One thing which is quite essential is the preservation of our tangible and intangible attributes of culture for the use of present and future generations. It is an alarming

issue. We all agree to apply the techniques and materials of so-called modern or the scientific world to preserve and protect the heritage including books, manuscripts, paintings etc. But we should not forget that ours is a beautiful country where large numbers of tribes and indigenous communities have been residing since time immortal practicing their own rituals, cultures, social norms, behavioral patterns and religious beliefs. The essence of plurality is in fact the power of India.

It is true that Palm-leaf and birch bark dominated as support for writings by the saints and the learned class but the situation completely changed after the advent of paper. And what would we do without paper? Imagine the feel of paper on which delicate miniatures were painted, the paper on which our vast cultural knowledge has been penned down with so much effort and care. From this thought arose my desire to explore the nearly 1000 year heritage of paper artisans in India and to establish the fact that the Japanese were not the only masters of this great craft and that very good quality paper was being made in our country.

History

Noor Mohammed's papermaking forebears, following the will of their Mughal lords, entered Rajasthan in 1500's when Akbar conquered the Punjab and his army chief, Mansingh, shifted Noor's ancestors from Sialkot to Tijara, north of Jaipur. Singh was honored by the creation of a special sheet produced in Sialkot that came to be known as Mansinghi paper. Noor's predecessors continued to move, propelled by drought and water shortages. Over 200 years ago, Maharaja Jai Singh, builder of the Pink City, sent Noor's ancestor's to Sāngāner, a village south of Jaipur, giving them use of the Saraswati River for paper making.

In Sāṅgāner every man of a paper family is related in one way or another. Since men, women and children participate in various aspects of paper making, unity is considered advantageous. Women used to prepare the fibers before electric beating machines were adopted. They usually live together in the Muslim section of the town; they share the same blood, the same clan name, and the same craft skills. Training and the passing on of these skills is achieved effortlessly within the family and reinforced in an environment humming with villagers engaged in similar activities. As a result, traditional Indian papermakers with Arabic roots belong to families self-contained now for many centuries.

Kāgẓī sheet makers were men of stamina, able to endure repetitive labour, lifting against the tremendous weight of water with every sheet, hands always wet, bodies standing in earthen pits or squatting above another pit for countless beck breaking dips.

Paper Material

Analysis of paper fragments indicates that primarily linen fibre or linen rag and starch size were the first ingredients. There is almost complete absence of physical evidence of paper's earliest days. The earliest known Jain manuscript on paper is dated 1229 (*Karakasambandhodyota*, Lalbhai Dalpatbhai Institute, Ahmedabad). Paper was mostly made from Linen, Jute, Sunn, Hemp, Gunny bags and even fishing nets. Elderly people still remember going as little boys to the market with his grandfather to buy old bullock carts bags. In the earlier days fibres were carefully picked up and sorting of impurities was done by hand. Before fibres were submitted to pounding, they were sometimes fermented after being washed. The bacteria fostered by this method help to pre-digest, break

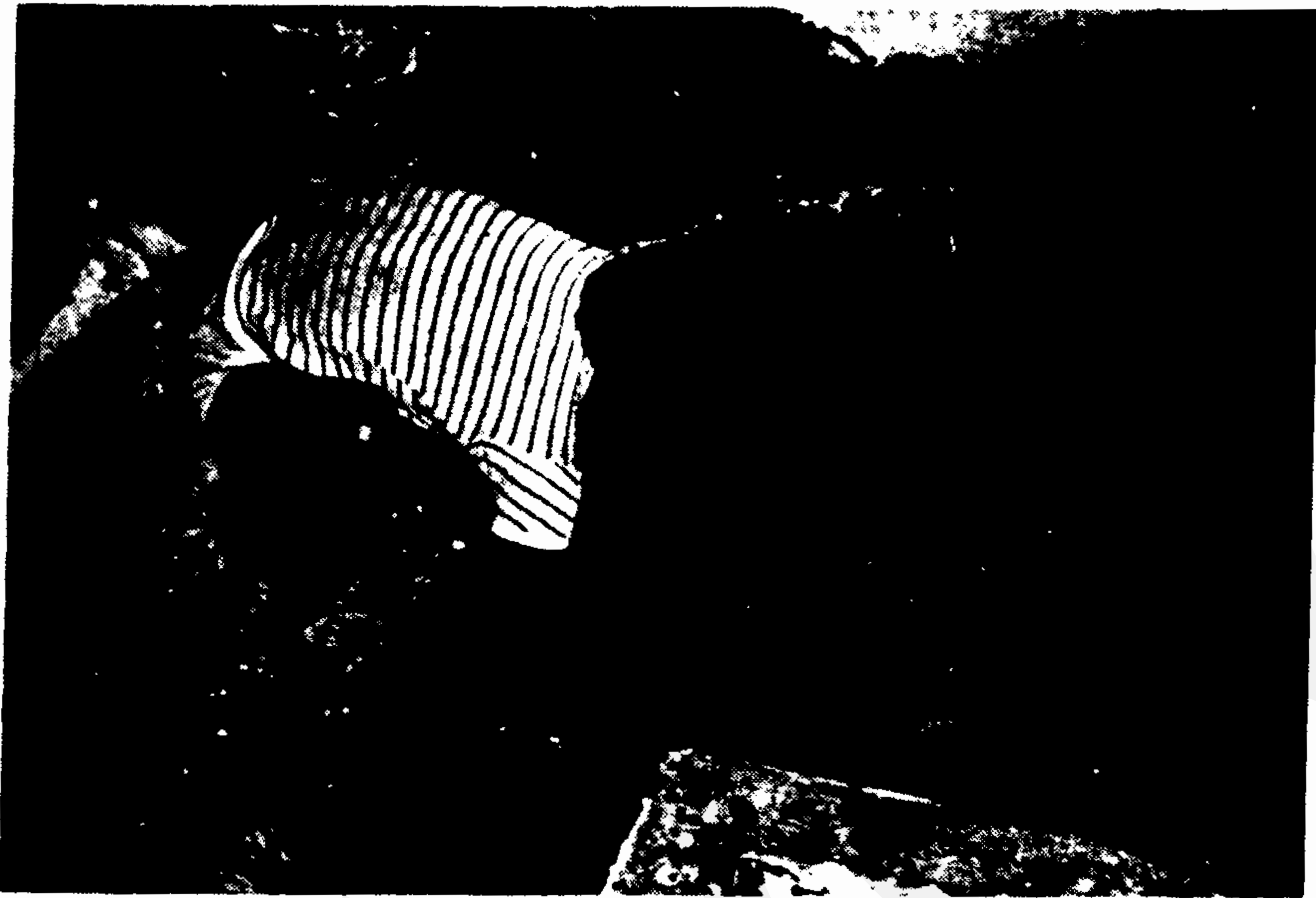
down and soften the fibres, fermenting is an old method that apparently has its roots in earlier oriental tradition. Circular troughs sunk into the ground form pits for fermenting, called often lies outside the papermaker's hut.

Cleaned raw material was mixed with a carbonate of soda called *Sajjī*, and left to soak in the pits for two to four days. One record indicates that *sajjī* comes from two wild plants, *kangan khar* (*Panicum italicum*) and Gora lana which grows in brackish soils. A detailed explanation of *sajjī* appears in Dard Hunter's book *Paper Making by Hand in India*.

. . . Workers cut the plant of the *kangan* in autumn and allowed them to dry. In the mean time a circular hole about 5 feet broad and 3 feet in depth was dug in the ground; at the bottom of this excavation was buried one or two earthen wares, the bases of the jars being level with the bottom of the pit. With a pointed tool a worker pierced numerous holes in the protruding portions of the jars, making it possible for any liquid to run therein. A fire was started within the excavation and heaps of the dried millet (*chena*) plants were thrown on the flames until the collected mass of vegetation had been consumed. The liquid expelled from the plants was flowed through the small pierced holes into the sunken jars. The residue was finally stirred and covered with earth, which assisted in the cooling process. In a few days time the earth was thrown aside and the workers had a mass of crude unpurified potash for their labour."

Besides the pits in which the wet pulp ferments, heaps of wet, retting fiber were often left to break down for several days under sun on *cabūtrās* (platform). The sun naturally bleached the fibres, which were also rubbed across rough *cabūtrās* in order to further break them up. Duration of fermentation varied according to the seasons and was usually two to nine days, with heat increasing the rapidity of the process. But

extra exposure also resulted in deterioration of the pulp, it becoming moldy and yielding inferior paper.



Often after fermentation the pulp was washed, beaten and the process repeated again. The process of fermenting, washing and beating was repeated five or six times at intervals of four or five days, until the mass was absolutely white and thoroughly broken.

The hardness or softness of sheet is first a reflection of the fibres used and second of how long they are beaten. For example linen experts its own quality in the sheet giving it a crisper look while cotton rag gives a softer appearances, similarly the longer they are pounded the harder or crisper is its appearance in the sheet.

One of the most difficult parts of preparation of pulp was the breaking down of fibres. This required substantial strength. One *Kāgzī* recalled that those who pounded fibers had “ribs of the width of four fingers” and another claimed “they would eat curd with 25 *capātīs* at one time.”

Wooden trip hammers, called *dhenkī*, with a pivot post and stone or pounding cap at one end, once roared thunderously as they macerated fibers placed in a well under the pounding pulp they were still used in India during the first part of this century, although none can be found today. It was moved up and down at the opposite ends, pounded by both men and women. The process of beating by hand led to a gradual breakdown of fibres and resulted in long stronger fibers that ultimately resulted in a paper with better strength and texture.

Making the sheet on a grass mould is the high point of the entire process, the metaphysical moment of creation when the craftsperson gains the satisfaction of seeing the motion of the hands turn a slush of fibre and water into a finished, well made sheet of paper.

Simply a combination of a rigid wood support, a flexible, handwoven reed mat and two removable sidebars, this lightweight tool, called a *cāparī*, has changed little during centuries of use. The quality of paper depends, not only on its raw material, but also on the mould and the way it is moved by the artisans, it must be well constructed and free of clogged fibres, sag, or dislodged reeds. Moreover, the quality of the shake given to the mould during sheet making determines how well the fibres bond and how evenly they scatter to form a sheet of uniform thickness. The materials for these moulds used to be inexpensive and easily available locally. Despite their use by Indian craftsmen for over 600 years, however they succumbed to the intrusion of heavier Western woven-metal moulds. Today, artisans still using the *cāparī* are numbered.

The traditional grass mould is weaved by knotting the vertical threads weighted by terracotta spools. Traditional horsehair threads used in the past have often been replaced by cotton thread or nylon filament.

With *cāparī* in hand and the pulp prepared, the paper maker is ready for the moment of truth-fabrication of sheet.

In Erandol, Khuldābād and other regions the vat person stood waist deep in an earthen pit, sheet making in another sunken pit in front of him while in Sāṅgāner, the artisan squats above a sunken pit, creating sheets by bending forward with a rather back-breaking scoop.



The paper maker holds the *cāparī* in both hand on either end, and it is dipped into the vat filled with pulp and water. Once balanced evenly across the horizontal axis, the mould is lifted up to the surface of the water. As it is raised, the suction is broken and for an instant before the water drains, the mould is guided into a back and forth, and sideways shake which orders the fibres, the grass mat and the wooden support,

bearing the newly formed layer of pulp, are for a second placed back down against the water in a quick floating motion. This detail of forcing the water against the grass mat makes it easier to remove sheets. Two sidebars are then taken away, and the grass mat is lifter from its wooden rest and turned over to release.

Papers made from traditional fibers were stacked one fresh wet sheet atop another and could later be separated for drying. Since contemporary use of cotton cuttings does not supply enough mucilage to prevent sticking, today cloth is interleaved between the stacked sheets.

Indian papermakers, working from such positions, could produce 175-500 sheets per day.

Most *kāgẓī* in their eighties or older describe the “*Do Pānī kāgaẓ*” or the double dip paper made to prevent sticking and to create a stronger sheet. In manager, one old elder recalls of making 500 sheets daily of these two-dip paper. This type of special paper is no longer made, and even the traditional single sheet, made by the hands of an individual artisan on a grass mould, is becoming an endangered art.



Drying of Paper

Wet sheets of every hue and quality were brushed onto the smooth plaster or lime washed outer walls of buildings to dry under the warming sun. Traditionally fresh sheets were stacked over one another and covered by rock weights that gradually force the water out; sometimes the weights are progressively increased. Finally, the sheets are peeled apart so that they can be dried. Papers dried this way become flat and smooth like the building and are peeled when the water has evaporated. Warm temperature effortlessly assists the process. Brushes used to feather stroke sheets onto drying walls are called *kūñcī* or *bowarā*. Sometimes they are made from a soft date palm frond or other fibers not quite as exotic as those of a brush Dard Hunter saw in Nowshera in the thirties made from the wispy beards of goats.

Wall drying is almost obsolete today with each year departure from tradition seems to be gaining an ever faster momentum though at least one family in Sāṅgāner still uses walls in a humble narrow alley between buildings.

Sizing

Many materials were used for sizing in India. In one of the larger semi-traditional mills in Sāṅgāner, a huge pot over an open fire relentlessly breaks down animal skin into a clear, glistening viscous liquid for sizing. Some Sāṅgāner sheet makers add starch sizing to the pulp as it is being beaten creating an "internal size" which prevents bleeding from any surface.

Hand Polishing the Paper Sheets

Today no one hand polishes paper except for a few rare individuals. The loss is dramatic considering that paper was still hand polished as recently as the 1930's. Polishing



implements were often beautiful and reveal surprising variety. Perhaps most common are the agate, quartz with exceptionally smooth surfaces called *goṭā* or *batter*. The feel of each of these tools is unique yet all have a grand, worn, touch-of-the-hand feeling and although hard, their silken must have eased the efforts of those who sat hour after hour, week after week, rubbing on an endless succession of paper sheets. As the worker tediously rubbed the agate back and forth over the paper's surface he occasionally brought the stone in contact with his hair, thus adding a small amount of oil to the agate burnisher. Both sides of the paper were vigorously polished this way. A poet describes in verse, the subtleties of polishing:

That paper must be polished so
That no creases appear in it
The board for polishing should be wiped clean
With a stone hand, but neither hard, nor softly.

A sloped wooden polishing board called *ghoṭlī* was often used for burnishing.

Under the pressure of growing commercial demand and for product diversification, hand made paper manufacturing units are using waste cotton rags that are cut into bits with the help of choppers after sorting. These are then cooked in open digesters with a low percentage of alkali and washed. Cut and dusted rages are beaten, with or without bleaching. The material is washed by means of washer drums followed by further beating. Wet sheets are lifted by the vat man with the help of wire mesh frames, either by dipping the same into traditional vat containing pulp or by pouring measured quantity of pulp into the mould held in the improved type paddle operated univat containing water. Coucher transfers the wet sheet to the sloth napkin or woollen felt by mild pressing of the mould. This lifting and couching process continues till a post of wet sheets interleaved with cloth/felt is made. The post is then pressed under a hand operated screw press or a small power operated hydraulic press after sizing paper is plate glazed between zinc? G.I. sheets and passed to and fro under heavy mechanical pressure through a small power, operated calendaring machine.

The paper has changed and so have the processes of papermaking and the paper makers. India is now emerging as a powerful supplier of commercial handmade paper due to advantages like plentiful raw material, an unending labour force, a penchant for color and variety and an unbroken craft tradition. The children, mother, father, uncle, aunt, grandparents at Sāṅgāner all interact in an active lifestyle based on shared craft goals. They still make paper, though changed over time. . .

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The Jain Approach to Conservation of Manuscripts

JITENDRA B. SHAH

(TRANSLATED FROM HINDI BY ANUPAM SAH)

Abstract

The Jain community in India is particularly sensitive to the preservation of manuscripts and the knowledge contained in it. The article discusses the tradition of conservation of manuscripts inherent in the Jain *dharma* and this tradition of conservation is illustrated through various examples of manuscript preservation effected by the Jains.

Introduction

We have been hearing about the traditional methods of conservation. Dr O.P. Agrawal too explained such methods in his keynote address. Even though most of the technical subjects have been talked about, I will try to place in front of you some of my thoughts related to the subject of conservation of manuscripts. In Jain *dharma*, there is a long history of manuscript preservation. As far as I know, the largest collections in India would be of Jaina manuscripts. There are numerous collections in Gujarat, Maharashtra and Rajasthan.

Today, in Ahmedabad alone, there exist lakhs of Jain manuscripts. In Pāṭan, Khambāṭ, Jaisalmer, Jamnagar, Baroda, there are thousands of manuscripts, in a good state of preservation. These manuscripts are preserved well and the main reason for that is the tradition of Jain *dharma* to conserve manuscripts as well as the knowledge contained in them.

Jñānācāra

According to Jain *dharma*, knowledge is taught as *śruta-bhakti*,¹ as *ācāra*,² to a *śrāvaka*³ even if the *śrāvaka* is uneducated. There are five *ācāra* in Jain *dharma* and the first of them is *Jñānācāra*.⁴ According to this, the duty of any *śrāvaka*, even if uneducated, is to conserve knowledge and wisdom. One of the techniques followed by every Jain individual is that of *Pratikramaṇa*. Every evening the misdeeds committed are discussed. Each follower of Jainism expresses devotion and asks for forgiveness in case any wrong has been committed towards any of the 84 lakh *yonis*.⁵ There are five *pratikramaṇa* and one of them addresses “knowledge,” “means of knowledge” and the “knowledgeable person.” Forgiveness is asked to atone for any “sins” that may have been committed knowingly or inadvertently in the form of touching manuscripts with the foot, mishandling, obliteration of ink using moist finger tips, using manuscripts as pillows. There is an aura of devotion that permeates the attitude of the Jain community towards their manuscripts.

1. That which one hears with devotion

2. Conduct

3. A practitioner of knowledge

4. Conduct with respect to knowledge

5. It is believed that there are 84,00,000 living entities in the world

Muni Śrī Puṇyavijayajī

Muni⁶ Śrī Puṇyavijayajī is one of the first *muni* who has been active in the field of preservation of manuscripts in the contemporary sense. More than five lakh manuscripts that were dispersed in collections in Pāṭan, Khambāt, Ahmedabad, Jaisalmer were catalogued and published by him. According to him, other than maintenance, we must also protect manuscripts against disasters both natural as well as State emergencies for which we must have a system to protect our collections. As an illustration, he mentions that during the period of Kumārapāla, about 950 years back, there was a change of power and Ajayapāla took charge of the throne. In order to remove all memories of Kumārapāla, he ordered for all the manuscripts related to the previous king to be destroyed. Vāgbhaṭa, the Royal Minister, knowing that the *granthabhāṇḍāra*⁷ will be destroyed, had the entire collection moved to Jaisalmer where he knew that the manuscripts will be safe.

Community Efforts

In a more recent incident, in 1947 at the time of the Partition, Gujranwala, a Jain centre with 20,000 manuscripts fell in the geographical boundary of the newly carved nation, Pakistan. When the possibility of partition loomed, the realized that *śrāvaka* it would be impossible to transport 20,000 manuscripts to India at this time. They transferred the manuscripts into cupboards and placed them in the cellar and built a wall around them and a floor above them. The *śrāvaka* returned to India but there was lot of pain of having left the manuscripts behind.

6. Sage

7. A repository of manuscripts

At that time they did not know what to do and it was not possible at that time to venture to retrieve the manuscripts due to the political situation. Afterwards, when the situation improved, Sristhi Kasturbhai Lalbhai of Ahmedabad who established the Lalbhai Dalpat Bhartiya Sanskriti Vidyamandir, the L.D. Institute, and a gentleman named Dharmavira of Delhi brought the whole collection from Gujranwala in Pakistan. This collection is now housed in the B.L. Institute of Indology situated in Delhi.

Sometimes there are other disasters, such as the earthquake that took place in Kutch. As various buildings including the *granthabhāṇḍāras* were destroyed, it became the duty of the members of the Jain community to retrieve the manuscripts, and they did not fail in their duty. Youth groups were organized and they brought back cupboard-loads of manuscripts from the earthquake affected areas to Ahmedabad. It is clear that the buildings themselves must be able to take care of themselves and thus safeguard the property and lives within them. When people themselves are being affected, saving manuscripts may seem like an absurd thing to do. However if a group is taking care of people, others can take care of other things, including manuscripts. Safeguarding our collections is our duty, it is a mission.

There are so many manuscripts that have been written over the years. Every Jain *śrāvaka* educated or illiterate must have a book written atleast once in a lifetime. This has been a practice for the last 1500-2000 years and the creation of manuscripts is thus a continuing process for the Jain community.

Local Treatment

Haldī, ghodā bac, aśvagandhā, tobacco are used to preserve manuscripts and I will not repeat them. One of the problems we face is that the custodians of manuscripts in the *granthabhāṇḍāras* are not trained to protect the manuscripts in a formal manner. There is a need to educate these people. Some manuscripts get stuck and such manuscripts are then immersed in rivers by some to save the manuscripts from inadvertent disrespect. In our traditional system, Muni Puṇyavijaya advised us to spread a fine powder on the folios whose ink has turned sticky due to the binding media having absorbed moisture. The folios do not stick then. To separate the folios that are stuck, the manuscript could be kept in a moist earthen pot. The moisture causes the manuscript inside to separate. It needs patience. When all the pages have been separated sprinkle *gulāla*⁸ or any other fine powder. To protect the edges against damage, we keep the folios between slightly larger wooden boards and then cover the bundle with cloth. The best, of course, would be a teak box preferably hollowed out so as to avoid joins and gaps. However this option may not be possible today due to the high cost and the diminished availability of teak wood.

References in Manuscripts

The method to bind manuscripts is illustrated in Jaina manuscripts that say, *the manuscripts should be tied like an enemy is tied*. This firm tying procedure protects the folios from the elements. We often find the following verse written on the Jaina manuscripts, *Protect me from water, protect me in the cupboards, protect me from loose binding and don't give me in the*

8. A coloured powder.

hands of the foolish. Who do we call foolish and who not? Perhaps in this context a foolish person is the one who does not care for the value of a manuscript and disrespects it. There is an instance when a scholar requested a Jain *muni* for a manuscript and began turning the manuscript pages roughly. The *muni* immediately took the manuscript back and told the scholar that the manuscript is not for him to study. Another verse exhorts, *Protect from fire, from water, from rodents. . . the manuscript has been written with a lot of effort, the neck, back and tongue of the scribe have contorted with the effort of writing the manuscript, so take due care.* The scribes write with such effort and we too must be sensitive to it and take care that we treat the manuscripts with due respect.

Concluding Remarks

In villages one of the major problems is that while many do not know how to look after the manuscripts, they will not part from them either. The key to taking care of manuscripts, I feel, is devotion to them and for their intrinsic value. We have been able to incorporate it into the system of the community in relation to the *granthabhāṇḍāras*. In the monsoons, as the manuscripts are not supposed to be moved, they are not issued. After the rains, the *granthabhāṇḍāras* are opened. On the occasion of *Pañcamī*,⁹ members of the community purify themselves, fast, remain in one place and express devotion to “knowledge” by taking care of the manuscripts by dusting them, checking for insect attack and other damages, exposing them to fresh air and light and then rebinding them if required. This is also known as *Jñāna Pañcamī kā Pūjan*, the Worship on *Jñāna* (Knowledge) *Pañcamī*. There is a continuous preservation process and the creation of new

9. The fifth day after the new moon as well as after the full moon.

manuscripts too. This is a small introduction to the way the Jain community looks after its manuscripts and I hope that this lecture complements the technical aspects that have been so lucidly discussed by the knowledgeable speakers before me.

Interventions

Shreenand L. Bapat: In the monsoons those four months were those when the Jain priest did not move out. Today that might not be the case. What happens now?

J.B. Shah: Is it done today too. The manuscripts are taken out beforehand and the stores are closed. The folios are wrapped carefully.

Shreenand L. Bapat: *Sādhus* are not allowed to keep personal possessions. Can a *sādhu* take a manuscript with him?

J.B. Shah: In the monsoons the *sādhus* would remain in one place. During the non-monsoon months, manuscripts are issued to them and after using them the *sādhus* returned the documents through any *śrāvaka* they may come in contact with. This has been a very reliable system and is extensively used.

Kadata of Karnataka

An Introduction

USHA SURESH

Abstract

Kadata or *Kadita*, also known as “black-book” is a type of manuscript little known outside the State of Karnataka in India. The author briefly introduces *Kadata*, its technology, dispersion and its importance as a source of historical information. The *kadata* of the Sringeri Maṭha have been prominently discussed in this article. The need for conservation of the *kadata* collections is being addressed and much more needs to be done.

Introduction

Inscriptions, monuments, coins, foreign accounts, legends, traditions, literary works, palm leaves and paper records are important source materials that shed light on the political, economical, social and religious conditions of Karnataka of the past. *Kadata* or *kadita*, though relatively unknown, is another important source material that throws light on different aspects of medieval and early modern history. The existence of *kadata* goes back to the fourth century BCE and they have been widely used in medieval and early modern times. The *Epigraphica Indica* mentions a stone inscription of about the first quarter of the eight century CE that refers to a *Kriyācirika*,

a deed of purchase written on a piece of cloth. *Kadata* is also known by other names like *pat*, *paṭkā* and *karpasika-pat*.

Technology

Buhler in *Indian Paleography* has noted that the Indians used to write letters on well-beaten cotton cloth. D.C. Sircar in *Indian Epigraphy* writes that according to historians, the mercantile community of the Mysore region is stated to have prepared their account books with sheets of cloth seasoned with a paste made out of the powder of tamarind seeds and afterwards blackened with charcoal. *Kadata* is a long sheet of cloth covered with a paste made of ground tamarind seeds and charcoal powder, well burnished with a smooth stone, dried, and folded in the form of a book of about two to three hundred pages that opens out like an accordion. Soapstone was employed to write on the *kadata* by the *Sambhoga* who used to register the records relating to land transactions. Sometimes while dispatching messages from one place to another, a sheet of *kadata* was rolled and inserted in the hollow of a piece of bamboo. *The Manual of the Administration of the Madras Presidency* mentions that a *Kadata* is a folded cloth seasoned with black-ink and used as an account-book in Kannada.

Dispersion

R.Narasimhachar, in his early twentieth century writing, states:

In the Sringeri Maṭha there are several cart-loads of *kadatas*, nearly 200 years old, stored in two or three big rooms. A careful examination of these *kadatas* is likely to reveal several interesting facts with regard to the history of the Matha, and it is earnestly hoped that the authorities of the Matha will arrange for this examination before the *kadatas* are lost or destroyed by white ants.

Besides Sringeri, there are other places in Karnataka, where *kadatas* are preserved. The Keladi Museum and the Vīraśaiva Maṭha in Simoga District also possess *kadatas*. About 250 *kadatas* of Yalanduru Jagirdar near Mysore, are preserved in the Mysore Divisional Office of the Karnataka State Archives. The microfilmed rolls of the Śringerī *kadatas* are available in the Karnataka State Archives, Bangalore. The Oriental Research Institute of Chennai, Śrī Mañjeśvara temple in Kerala, Śrī Gokarana Partagal Maṭha in Goa and Kāśī are some other places where *kadatas* are preserved. There are about 205 *kadatas* that contain *nirupas*¹ and *binnavatṭales*,² and these are more important from the historical point of view. Such records registered in the *kadatas* number around 15,000. Other than these, there are about 548 *kadatas* that contain matters related to accounts.

Historical Records

The records throw light on political, administrative, religious, economic and social conditions from the fourteenth to the nineteenth century of the Sringeri Dharmasamsthāna in particular and Karnataka in general. According to the records in the *kadatas*, temporal powers like the Ādil Śāhīs of Bijapur, Mughal officers, Nizāms of Hyderabad, Haider Ali and Tipu Sultan of Mysore, Vijayanagara, Keladi, Marāṭhās, Wodeyars, the British and several chieftains made endowments to the Maṭha and respected the presiding elders, the *Jagadgurus*, over the ages. There are over 18 letters written in 12 *kadatas* that help to throw light on the correspondence between the Sringeri Maṭha and the Marāṭhā Ruling Houses like Peśwās, Ghorpades, Sindhiās, Holkars, Bhosales and Pawārs and

1. Orders.

2. Letters of respectful communication and petition.

various sprincipalities in India. There are about 60 records spread over 15 *kadatas* that inform about the correspondence between the Sultan of Mysore and the Sringeri Maṭha and about 160 records spread over 43 *kadatas* that establish the close contacts between the Sringeri Maṭha and the Wodeyar dynasty of Mysore.

Thomas Munro, collector of the Canara District in 1800, states that *Sambhogas* of the Canara District used black-books for several centuries to register *paṭṭās* relating to land and land-revenue accounts. It appears Munro himself used such *Kadatas* while reintroducing the land-revenue system of the Vijayanagar period (CE 1336-1565), in the Canara District.

Generally, the records in the *kadatas* are dated in Śālivāhana Śaka era while the *binnavatṭaleśa* issued by Haider and Tipu are in *Hijri*. Besides these, the *Kali* and Christian years are also used. Many records are in the Kannada language and script while there are some in Sanskrit, Marathi, Tamil, Telugu and Persian languages though the script of all of them is Kannada. The records in different languages point out the Śrī-Maṭha's contact with various principalities in India.

The above cited examples are but a few illustrative records from the *kadatas* of the Sringeri Maṭha. As mentioned earlier, there are about 15,000 records registered in 205 *kadatas*, besides the account books. It is in this context that one can well imagine the fund of historical information stored in these *kadatas*.

Concluding Remarks

While examining and conserving some *kadatas* of State Archives, it has been observed that they are better preserved than any other documents of the same period. In the meantime, a sincere attempt is being made these days to conserve *Kadatas*,

palm-leaves and other paper records by the Sringeri Maṭha under the guidance of the Bangalore Centre of the INTACH, Indian Council of Conservation Institutes and the Regional Conservation Laboratory, Mysore.

In order to undertake an intensive drive for the conservation of *kadatas*, it is proposed by the Karnataka State Archives in collaboration with Regional Conservation Laboratory Mysore, to undertake a project as well as to organize a seminar using the services of experts in the field to throw light on the following:

1. History of *kadatas*
2. Survey, documentation and status of preservation of *kadatas*
3. Material and technology of *kadatas*, and
4. Conservation of *kadatas*.

Interventions

Tej Singh: I am happy to know that work is being done at the Sringeri Maṭha with the help of INTACH, Indian Council of Conservation Institutes and the National Research Laboratory for the Conservation of Cultural Property.

Shreenand Bapat: These are State records. Are there any seals or stamps on them?

Usha Suresh: Not state records, only matha records. They are not in the possession of our archives. They are essentially account matters.

G. S. S. Rao: Any document coming from the Mysore Maharaja to Sringeri was copied faithfully on the *kadata*. The original document remains elsewhere. With the passage of time, as

the originals have been lost, only the *kadata* remain that were there only for the *maṭha*'s reference. As the matter has been accurately copied, the *kadata* become most important as sources of information.

Saroja Bhate: From the point of view of historical importance, *Kadata* are very useful. In fact, we know more from *kadata* than from inscriptions. There are no paper letters or records as the Vijayanagar endowments were all recorded on the *Kadata*. These aspects are well known to historians. It is the technical aspects related to conservation etc. that must be given more consideration.

Indigenous Methods of Conservation of Manuscripts in Manipur

K. SUSHILA DEVI

Abstract

This paper touches upon the various natural plants and materials used for conservation of Manuscripts especially in Manipur.

INDIA is a land of rich heritage. Compared to the other countries of the world it is richest in terms of manuscripts. In spite of the enormous diversity of languages and cultures; we are one in terms of our manuscripts. We have manuscripts in different scripts and languages, but in writing and structure, the manuscripts are very much alike. It proves that our civilization is made up of different colours strung together in one thread.

We are the richest in terms of manuscripts but to preserve such rare and priceless antique articles, we must use certain methods. It is not only for our own benefit but for the benefit of our future generations. Our forefathers used different plant products and their extracts for preservation, which are more friendly to our health and surrounding.

Everything has its durability. But by using certain methods and plants extracts it can be made more durable and the life span of the material can be made longer. Some of the plants

or animals products used as preservative and methods are mentioned below.

Use of Cow Urine

The writing materials should be first dipped in the urine of cow for 5 to 6 hours. The urine penetrates the writing materials and makes it more durable. The alkaline nature of urine makes the material disliked by the insects and worms, thus helping in preservation. Further, the process can also be used to make the existing manuscripts waterproof.

Uses of Neem Leaf or its Fruits (*Malia Indica*)

Either Neem leafs or fruits are first boiled with water thoroughly to extract the alkaline contents. After the solution has cooled down, it is filtered through clean thick cloth or cottons. The filtered solution is smeared in the writing or already written materials as Neem is a natural insect repellent.

Uses of Tulsi Leaf (*Ocimum Sanctum*)

Tulsi leaves should be kept between folios of the manuscripts to prevent insects from attacking the manuscripts and to make it more durable.

Uses of Oxalis Leaf (*Oxalis Rectriculatus*)

The use of oxalis leaf is also a very convenient method. The plants are found in abundance in nature. First of all, it should be burnt very slowly without producing much flame. The smoke coming out of the raw burning of the oxalis leaf is a preservative. The smoke is introduced in the manuscripts once, which makes them free from the attack of insects and worms for more than ten years. So the process should be repeated after 10 to 11 years.

Uses of Marigold Leaf (*Tezecta Indica*)

The petals of Marigold flower are used as preservatives by keeping them in between the folios of the manuscripts. Marigolds have a natural tendency of repelling insects and worms.

Use of Tobacco Leaves (*Nicotine Tobaccum*)

Solution of Tobacco leaves is very useful. The solution of tobacco leaves in water is smeared in the manuscripts or the dried leaves are placed in between the folios. The benefit is tremendous as the insects are repelled from the manuscripts.

Use of Red Cotton Cloth

Manuscripts should always be wrapped in red cotton cloth because red colour is a natural repellent of worms and insects.

Use of Wooden Plank

Manuscripts should always be covered from both sides by a wooden plank, a bit larger than the manuscripts. It makes the manuscripts safe and prevents them to come in sudden contact with fire in case of fire accident. Lastly the wooden planks should be tightened with a thick cotton string.

Mode of Keeping Manuscripts

The manuscripts should always kept in a rack, which should be at least 4 to 5 feet above the ground level. After preventive measures are done, the manuscripts should be placed in racks. It prevents the manuscripts from coming in contact with water vapours, which causes damage.

Room for Keeping Manuscripts

The manuscripts should be kept in a well ventilated room free from moisture. The room should not damp and should be kept clean, dry and airy.

Writing Materials

According to late Pandit Achouba Ng. Kulachandra Singh the material used for manuscripts is varied and rich. Papers of various grades, palm leaves, barks of *Kona* and *Tengna* (leaves resembling Palm-leaf), *Agor*/birch bark, *bhūrja patra* and, *meitei* leather for *sading puya*. *Meitei Che* are seasoned and polished before they are used. We have little information about *Meitei Che* prior to the reign of Khagemba.

Indigenous paper technology flourished in ancient and medieval Manipur. A thick type of *Meitei Che* is found to have been manufactured and used for writing *puyas*, horoscopes, almanacs and records of information and secrecy. *Meitei Che*/paper is thick and hard. It is softened by the rubbing of Kinghkin (*costus speciosus*) for the purpose of writing. There is a need to revive this technique.

There are many illustrated manuscripts like the map of Kangla, Paphal, Subika, Subika Laishaba, etc, which are important from the point of view of calligraphy, colour and glimpse of fine arts.

Papers and manuscripts are made into a bundle of folios. A single folio of a complete treatise does not constitute a separate bundle. Some other written folios of a separate treatise are placed next to that of a single folio. Thus, we find that often several works (chronicles, literature, astrology, music, etc.) are tied in one and the same bundle. The damaged

part of a manuscript page can be rewritten with the help of a great *Pandit/Maichou* who is aware of the text.

Normally a *Pandit* is engaged in all the stages of book production, comprising the preparation of *Meitei Che*, *Agor Bak* writing, making the hard wooden cover and binding the bundle with a *Meitei Cloth*. It shows the multiple functions of a scribe. It does not involve division of labour relating to collection, preservation, copying the manuscripts, book binding with leather and needle.

The *Salais/Sibs* and other clans believe that the careless keeping of genealogical manuscript is said to have been the cause of accidents, ill luck and the shortening of life span.

Technique of Preserving Rare Manuscripts

The *Salais* never give the sacred *puyas* to the hand of non-Meiteis. The collection and preservation of manuscripts are made by the *Meitei* inhabitants of Myanmar, Cachar, Takhel and Tekhao/Assam.

They have deep reverence for the *puyas*, therefore, many of the people are not trained enough in this field, which involves the understanding of the *Lairol*. The manuscripts remain in the custody of *Pandits*, where they are preserved. Many of them fall pray to insects. This proves fatal for their preservation as they are lost to the world of scholars. The practice of burying the damaged manuscript has naturally destroyed some of them.

Method of Conservation Adopted by the *Loi*/Scheduled Castes

The practice of preserving manuscripts among the Scheduled Castes/*Lois* viz. Sekmai, Khurkhul, Leimaram, Phayeng, etc.

is similar to that practiced by the people of Burma and Myanmar and is very interesting. Manuscripts were preserved underground by a practice, according to which the leaves are wrapped in *Leihoura* leaves (they look like plantain leaves), which can resist the attack of white ants and insects. The underground heat and moisture cannot harm this leave.

A type of black varnish called *Khe* (which grows in the Kabow Valley), is obtained from the juice of Kheu tree/*melanor how writata*, is applied on the bundle in order to make it waterproof. The *Lois* belonging to the South Eastern side of the valley are in the habit of burying the book bundle in the cremation ground of their forefathers and old relatives with their ashes.

Need for Revival for Literary and Sacred Purposes

In the opinion of late W. Yumjao, the ruler was the custodian and responsible for the preservation and safety of the places where manuscripts and things of archaeological values are buried under the ground. The rulers would spread the rumour that if it is unearthed the ruling prince would die early. So any request for unearthing a place was flatly refused by the Mahārājā and his *Pandit* Loisang. The superstition is attributed to the fact that they were greedy and were eager to possess the precious material buried underground including Manuscripts for their own interest without serving the purpose of preservation.

It is urged that documentation of damaged manuscripts, making old descriptive catalogues and Indigenous methods should be preserved before it is too late. It is the duty of the State Archives to authenticate them through experiment and to encourage the use of manuscript for the benefit of the public.

The section on the manuscript must be developed into a full fledged library through acquisition and preservation. The Department may venture to publish a bulletin in bi-lingual containing printed rare and unpublished manuscripts from Assam, Myanmar, Arunachal, Sikkim and Bengal.

It must continue the camps, workshops, seminars for training the people of this part of India which are increasingly popular as in these years. In the light of the present circumstances of resource scarcity, constraints in infrastructure, ecological uncertainties of scientific alternatives, building up on traditional or indigenous practice constitute a practical means of meeting our essential needs.

Periodic Reading of Manuscripts

The manuscripts should be read periodically as they are a source of knowledge. If damages are found, then preventive measures should be taken up.

We in the present generation have used organic and inorganic chemical as preservatives. Some of the chemicals are Ketone, Thiamol, Copper Sulphate, Silica gel etc. Besides they are hazardous to health and are not available in remote parts of the country. On the other hand, the use of such chemicals needs scientific knowledge, but the methods are hardly understood by the common people. The indigenous practices of preservation are friendlier to our health and surrounding eco-system and are easily practicable.

Today our age-old manuscripts, the rare priceless antiques should be taken care of and preserved for the future. We are indebted to our forefathers for keeping and preserving such priceless and rare manuscripts. The educated youth of the present generation, do not realize the importance of

manuscripts. At present, the manuscripts are not thought of seriously, except by some interested persons. If such practices continue then the rich heritage will surely be in a state of ruin.

Lastly, I would like to make an appeal to all, that without these age-old manuscripts no one can make a research successful, in the field of either arts or science. Paper making technique did not progress beyond a certain stage on account of influence of modern paper. Writing was less in use in earlier times. Paper making style could not survive here while in other parts of India and the world it was fast advancing because of sheer necessity and state support. This created the impression that paper and paper making came to Manipur from outside.

Decline and Revival of Forgotten Manuscripts Traditions

ANUPAM SAH

Abstract

Revival of an art form such as forgotten manuscript traditions involves various tangible and intangible aspects. It is pertinent to understand how different manuscript traditions evolved while some fell to disuse. The components of a revival effort are many and need to be considered together. A possible approach to initiate the revival of the manuscript traditions is outlined along with some real benefits of such an exercise.

Introduction

While working to conserve manuscript collections, we find that the art of creating manuscripts, their materials and tools and the intangible aspects associated with the process have been forgotten. The people who created and those who can still create exquisite manuscripts, have been largely ignored. Yet another art form lingers on the edge of the endangered human practices. Manuscript writing traditions progressed over centuries from writing and inscribing on stone tablets, metal sheets, leaves, bast, and paper prepared by hand and then eventually on paper manufactured on machines. Today

many thoughts are typed by authors directly on the computer and printed digitally. This article introduces the elements of traditional processes of creation of a few types of manuscripts, the reasons why the traditions began to cease and were replaced by others. The components of a manuscript revival are outlined along with a possible approach. The article concludes with an idea of the network benefits and brief concluding remarks.

The Body and Soul of a Manuscript

Support

Other than stone, metal and proteinaceous surfaces such as parchment and vellum, manuscripts in India have predominantly been prepared on surfaces made of plant material. The plant material has either been used very close to its original form such as in *Bhūrja Patra*, birch bark, *Tāla patra* or palm leaves, or it has been processed as in the case of *Hāṁsī pat*, the bast of *Agaru* tree and palm leaves too. Through a more vigorous intervention, plant fibres have been beaten to pulp to form sheets of handmade paper, the surface of which is smoothened and burnished to make it suitable for use as a writing support. Other supports such as those of a *Kadata*, have been prepared using a cotton cloth base on which was applied a smooth ground of chalk and plant gum binder. The shapes of manuscripts vary from loose or bound folios to accordion shaped or long scrolled documents.

Inks

The ink can be made of pigments usually of earth and mineral origin. Vegetable origin “pigments” are essentially dyes precipitated on white inert powders. Sometimes dye-based inks have been used too. The pigments are often made into a

concoction with ferruginous elements and vegetal additives. This is often tempered with a binder.

Text and Illustrations

The text can and does relate to a variety of subjects ranging from poetry, grammar, treatises, to land and revenue records. The text can either be surface written or it can be incised into the surface of the writing support, and then inked in. The illustrations accompanying the text can be diagrams by the scribe or they can be sketches and painted images supporting the text and drawing inspiration from it.

The Process of Writing

The action of writing itself is a very personal process imbued with various feelings that can be of quietude, spirituality, exhilaration or intense emotion or also of pure detachment. It is the complementary involvement of the mind and the physical body in order to manifest thoughts into writing. It is a process that both emanates and is actualized by the being.

Environment

The manuscript making process leads to a creation of micro environments both at the community as well as the individual level. Besides the creation of an environment of working together and a creation of an ambience where the communities are involved, is also the creation of the individually energised space that contains the scribe writing meditatively as well as the space of the reach of the scribe's mind.

Purpose of a Manuscript

The process of creation of a manuscript can broadly encompass aspects of education, communication, record keeping, selfless

service as well as conscious efforts to earn temporal or spiritual merit.

Human Interactions with the Manuscript

The contents of a manuscript as well as the body of the manuscript are an inter-phase between a human being and a human creation. Interactions with manuscripts can be in the form of reverence, ritual worship, a desire to glean knowledge, repetitive use or a glancing reference. The reading itself of the contents can be imbued with a variety of emotions and can manifest as silence, loud announcement, whispers, personal or community singing in folk style or in well laid out chanting rules.

The Outer Covering

The tendency for safekeeping of the manuscripts has resulted in a variety of covers, binding methods and containers. These, like the texts can be simple and effective or gloriously embellished and visually arresting and can be made of a variety of materials such as wood, metal, bone, ivory or cloth.

Thoughts on revival of manuscript traditions must then take into consideration a revival of many components and not just fabrication of handmade paper. The thought on revival brings to the fore a hint that something passed away, that it died. Did our manuscript traditions really die? If they did, then why?

Decline / Evolution of the Manuscript Traditions and their Revival

The common refrain that one hears is that the advent of modern manufactured paper sounded the death knell of our glorious manuscript traditions. Perhaps our manuscript traditions have

never died; perhaps they have organically evolved into other effective manifestations of human expression. Then again, manufactured paper was just another element that contributed to the evolution of our writing traditions.

With human progress in time, the materials in use for imparting education, effecting communication, as well as record-keeping changed over the decades. For centuries privileged children learnt to handle a *lekhanī*, a *panhinda* or a metal stylus to incise letters on a Palm-leaf. With time, chalk and slate made inroads into primary schools as well as institutes of higher learning. Pencils at one time were for slightly older children and for those who could economically afford them. Ink pots and fountain pens were a sign of graduating to higher standards of schooling, but that too gave way to the ball pen and that in turn has evolved into a plethora of gel pens and micro tipped ink cartridge writing instruments. With the advent of white boards and markers and electronic projections, even the black boards are being supplemented and may eventually be completely replaced. The varieties of paper that came into the markets nurtured a change in the writing instruments too.

Along with our traditional writing techniques and manual calligraphy, came adherence to rigorous self-discipline, sincere effort and the praise and the admonitions of the teacher. Changing social perceptions had their effect on the relationship between the teacher and the student.

Our requirements changed and to illustrate it with the subject of record keeping, we have seen that our volumes of records increased dramatically. Our filing systems changed as did our storage and retrieval systems. From shelves to compactors and now to digital discs, these movements of

human requirements affected the way we created our manuscripts too.

Communications on scrolls adapted to the evolving postal system. Very important have been the changing tastes and preferences of the users, us. Introduction of standardized formats such as aerogramme, inland letter and postcards and the mechanical, electronic and digital medium today have created another genre of manuscripts, where the hand that can also write now creates alphabets through a machine. Some can do it better and more skilfully than others. That too is a skill and perhaps an art. The mind is still involved as it was centuries ago.

Going by the assumption that our manuscript traditions never died, but evolved into other effective means of expression we may say that our manuscript traditions have been forgotten during the ensuing evolution of human activity. Many of us may acknowledge that memories of human progress run deep and true, and when that is the case, it is only a question of reviving our memories and reliving them in order for them to manifest again as beautifully as in the past. The manuscript traditions when revived would again be a tangible expression of human effort to connect time and again with our own past even as we endeavour to link our effort to human progress into the future.

Components of a Revival

Revival of the manuscript traditions would include both the tangible and intangible components. Some of these components are those mentioned as the body and soul of the manuscript in the opening paragraphs of this article. The basic ones can be listed as:

- Revival of the physical material and technology associated with manuscript traditions
- Identification of the practitioners, teachers and students
- Revival of the rituals and traditions that accompany the use of the physical components
- Revival of the skills and numbers of practitioners
- Revival of the teaching methods by which the skills and the processes of the tradition can be imparted
- The patrons and the end users
- The positioning of the pure revived form and its adaptation and modification by contemporary society
- The context within which the revival effort is made
- The context within which the revived tradition will be practiced
- Sustenance of the revived tradition
- The legal and moral realm of intellectual property rights

A Possible Approach

Some of the steps that would be necessary to undertake a Revival exercise can be summarized as follows:

- Identification of patrons with whose support the process can be conducted over an initial period of one or two years
- Identification of a coordinator well versed in material and technology of manuscripts and with experience in working with communities on similar efforts

- Documentation and research of the material and technology of the forgotten traditions. Testing formulations for their authenticity and durability
- Establishing faith with the old practitioners and assuring each other of working together to revive the tradition
- Identification of practitioners of varied age groups including old practitioners with memories of the tradition, and young ones, skilled and with the ability to absorb the tradition
- Establishment of a project school where the pure form of the manuscript tradition can be pursued and disseminated
- Creation of attractive exemplar “sample” manuscripts and the processes that can be displayed and used to advocate the first signs of “revival”
- Identification of strategic partners to showcase the process and product to catch the imagination of the public and policy makers
- Creation of a demand: The creation of a demand for the manuscripts. The demand can be for paper, the inks, the tools or the materials as well as the finished manuscript. The created manuscript would be in demand not only for the finished product but also the manner in which it has been created. The various avenues to incorporate the revived tradition in daily lives and on special occasions should be explored
- Consider systems that ensure a fair livelihood to the practitioners and encourage a growth of the tradition

- Document the process and disseminate the results and improve the process for future related activities

Benefits and Concluding Remarks

Events and actions are intrinsically interrelated. The revival exercise and the final results can help in the creation of such schools of learning for other crafts too. This itself can spawn a major livelihood movement that also develops self esteem and pride in local skills and traditions. A variety of ancillary products and employment opportunities can develop. It can lead to the creation of heritage nuclei in various parts of the country and those can then be levers for socio-economic development. Manuscripts writing is an arm of the education traditions and could be networked with national education systems to encourage learning at the primary level and encourage research based on primary sources at a higher level.

Manuscript preparation is closely linked with our natural vegetation and can result in a regeneration of local green covers in order to provide a controlled source of species that have by now become very sparse and almost extinct in their natural environments. Rural development, empowerment of women and of the physically challenged can all be incorporated at their local levels in this exercise. Even the Incredible India Campaign is probably waiting for something like this to happen.

We go to great lengths to preserve the endangered Mountain Quail. The Edelweiss is a protected flower. Thousands raise a cry to preserve a local monument. Let us then give one try to revive at least some forgotten human traditions also, perhaps our manuscript traditions, to begin with.

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