International Scene

MARJORIE BARRITT and NANCY BARTLETT, editors

The Preservation of Books and Manuscripts in Cambodia

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Abstract: In April of 1989 Cornell University, with the support of the Christopher Reynolds Foundation, began a modest program to preserve scarce and unique library and archival materials in Cambodia. Cornell's involvement was an extension of the university's research and teaching activities in Southeast Asia including Cambodia. Preservation efforts are needed because of the devastation and neglect of collections resulting from decades of war. During the three-week project, the author surveyed the collections, trained staff in a variety of basic preservation techniques, assisted in the identification of preservation priorities, made arrangements for the shipment of conservation supplies, and developed plans for the establishment of a microfilm operation. Through the combined efforts of the Christopher Reynolds Foundation, Luce Foundation, and Cornell University, these preservation/conservation initiatives are continuing. In the fall of 1989 Cornell began a project to film on location important materials in Phnom Penh.

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IN APRIL OF 1989 Cornell University, with the support of the Christopher Reynolds Foundation, began a modest program to preserve scarce and unique library and archive materials in Cambodia. The preservation efforts are needed because of the utter devastation of collections in Cambodia resulting from decades of war, destruction and neglect, and Cornell's involvement is a natural extension of continuing activities at the University.

Cambodia/Kampuchea

Cambodia is quite a small country, covering an area of less than seventy thousand square miles, but its location, bordering Thailand, Laos, and Vietnam, has involved it in war and internal strife for hundreds of years. Khmer civilization and culture is rich and diverse. From the early Christian era to the eighth century A.D., the Hindu-Buddhist kingdoms of Funan and Chenla dominated, with Chenla achieving complete sovereignty until the ninth century when the Angkorean period began under Jayavarman II, a classical period lasting from 802 to 1432. Over the next four hundred years, Khmer rulers were involved in continuing wars with Vietnam and Siam, often becoming vassals of one or the other states. The four centuries of strife abated in 1864 with the establishment of a French Protectorate that lasted until the end of World War II. During World War II, the Vichy government was maintained by the Japanese occupation. In 1941, the French installed Prince Norodom Sihanouk, and Cambodia continued as an autonomous state within the French Union until independence in 1953. Sihanouk's rule ended in 1970 when he was deposed by General Lon Nol. During the early 1970s massive and apparently indiscriminate American bombing coupled with widespread corruption caused general disaffection with Lon Nol's government, and in 1975 the Khmer Rouge took over the country. In 1976 the Khmer Rouge leader, Pol Pot, declared the Republic of Democratic Kampuchea, and with the support of the Peoples Republic of China, proclaimed the Kampuchean Communist Party the governing body.

The Khmer Rouge systematically began to destroy all vestiges of the former "corrupt" culture, forcibly evacuating the capital, Phnom Penh, and directing the population in massive and ineffectual agricultural schemes. By some estimates, more than three million people died from ill treatment and starvation, while most of the educated and middle classes were exterminated as "enemies of the people." In 1979 the Vietnamese army invaded, forcing the Khmer Rouge into remote regions of the country and installing the current Hun Sen government. In September 1989 the last remnants of the Vietnamese army withdrew. Earlier in the year as a preliminary to the Paris peace talks, Hun Sen restored

Book storage at the National Library of Cambodia. Note the palm leaf manuscripts in the foreground.

the name Cambodia and the national religion of Buddhism.

At present, because of the taint of Vietnamese collaboration, Western nations have not established diplomatic ties and the United Nations has not conferred recognition; thus, Cambodia is languishing on the edge of survival while fighting a rearguard action against the Khmer Rouge guerrillas.

Cornell University's Cambodian Connection

Cornell University has provided strong support to research and teaching in all aspects of Southeast Asian studies for many years. Currently seventeen full-time faculty in the College of Arts and Science and the College of Agriculture and Life Sciences are involved in an interdisciplinary program of teaching and research on the history and culture of the region extending from Burma to the Philippines. Within the current academic year, fifty-seven courses specifically concerned with Southeast Asia are offered, while an additional twenty-three courses dealing extensively with Southeast Asia are offered in a broad range of departments. Southeast Asian languages taught at Cornell include Burmese, Cebuano (Bisayan), Indonesian, Javanese, Tagalog, Thai, Vietnamese, and Khmer. The strength of these programs has provided Cornell with a network of scholars, many of them Cornell graduates, throughout Southeast Asia.

The library and archives collections built to support the Southeast Asian program at Cornell are concentrated in the John M. Echols Collection and in extensive holdings in the Department of Manuscripts and University Archives, both at the Olin Library. The Echols Collection, generally regarded as one of the foremost collections of materials on all aspects of Southeast Asia, has the largest collection of Cambodian materials in the world. Given the deliberate destruction of libraries and archives in Cambodia, the Echols Collection assumes an even greater importance as the guardian of much of that country's national bibliography.

Through the university's connections with former graduates working for nongovernmental agencies in Cambodia, the Echols' curator, John Badgley, began the lengthy process of negotiating with the Cambodian Ministry of Education and Ministry of Culture to establish a formal Cornell program for collection development and preservation. After three years, Eva Mysliwiec (Cornell graduate and field director of the Partnership for Development in Kampuchea, a consortium of nongovernment agencies), was able to obtain permission for a Cornell graduate student, Judy Ledgerwood, to visit in the late summer of 1988. Miss Ledgerwood was able to provide some assessment of immediate needs in the National Library, deliver two microfilm readers as a gift from Cornell, and help strengthen Cornell relations with Cambodian officials. Since both Eva Mysliwiec and Judy Ledgerwood are fluent in the Khmer language, they made considerable progress, including arrangements for Cornell to receive Cambodian periodicals and newspapers on a regular basis.

In September 1988 Miss Ledgerwood presented a paper to the Second International Conference on Cambodia held in Washington, D.C., in which she described appalling conditions in Cambodia's libraries and archives.[1] It was clear that no improvements had been made since the previous year's report by Helen Jarvis, an Australian librarian.[2] Based on the Jarvis

[1]Judy Ledgerwood, "Worldwide Efforts to Preserve Khmer Language Materials" (Paper presented to the Second International Conference on Cambodia, Washington, DC, 30 September 1988).

[2]Helen Jarvis, "A Visit to Kampuchea, 9th to 23rd July 1987: A Report," *Southeast Asian Research Group Newsletter* (Australian National University) 35: 43-48.

and Ledgerwood reports, a short conservation training and survey visit was proposed by Cornell University Library to the Christopher Reynolds Foundation. Cambodian officials, aware of the general nature of the problems, had repeatedly requested a visit by a trained conservator. The proposal outlined a strategy to train staff to stabilize endangered materials, to assess more fully conservation needs for future action, and to evaluate the feasibility of establishing a microfilming operation. With an award of $9,800 from the Christopher Reynolds Foundation, $6,000 worth of supplies was dispatched and arrangements made for my three-week visit. Thanks to funding from the Luce Foundation, John Badgley and Judy Ledgerwood accompanied me: Badgley to help develop and consolidate arrangements for microfilming in Cambodia, Vietnam, and Burma; Ledgerwood to act as my interpreter and facilitator.

Unprocessed books rescued from the streets by Cambodia citizens following the Khmer Rouge destruction of the library collections.

Phnom Penh

The flight from Syracuse to Phnom Penh involved plane changes at Newark, San Francisco, Hong Kong, Bangkok, and Ho Chi Minh City (Vietnam), with an overnight stay at Bangkok. Two Cornell alumni and former Echols staff, Rattikul Oey and Anucha Chansuriya, met us at the Bangkok airport and delivered us to our hotel. During the two hours of frustrating visa negotiations at Tan Son Nhut airport (Ho Chi Minh City) prior to our Air Kampuchea flight to Phnom Penh, I realized the importance of Judy's great patience and her fluency in Khmer, qualities I was to value even more as the visit progressed. Cambodia is a difficult country for Westerners to visit, and visas are complicated and hard to obtain. Moreover, travel to Cambodia is discouraged by the United States government, and no Western nation maintains diplomatic relations with what the United States refers to as an illegally installed government. I was again grateful to Cornell's network of scholars, as Eva Mysliwiec expedited our passage through the Cambodian customs and drove us in her agency Land Rover to our hotel, the Monorom in Phnom Penh. My first impressions of Phnom Penh were of an elegantly laid-out city with wide streets and boulevards, very much in the French colonial style although many of the buildings and roads were in poor condition, and the streets were filled with people sweeping and cleaning in preparation for the New Year celebrations. The hotel, one of three set aside for foreigners, was clean and my room tidy though sparsely furnished. Most of the guests were members of various nongovernment agencies, such as Oxfam, involved in volunteer three-year stints to help the Cambodians rebuild some of their basic systems (e.g., sanita-

tion, water, irrigation). Most were Australian and British midcareer professionals prepared to work in difficult conditions for bare subsistence salaries, tangible evidence that altruism is still alive. Members of the International Red Cross seemed mainly to be French and Swiss, while the staff of UNICEF, the only United Nations agency permitted to work in Cambodia, came from a variety of nations. Another, rather grander hotel, the Samaki, housed the UNICEF and some other agency offices, as well as being the residence of agency personnel with families.

After the chill of central New York, the heat and humidity seemed crushing. Our visit was towards the close of the dry season, just before the onset of the hot, wet monsoon that would last from May to October, causing temperatures to soar above 100°F, with relative humidity in the nineties. My first walk in the dank, mildewy dawn disclosed rapidly gathering crowds of gaily dressed people preparing for some of the traditional religious ceremonies of the New Year. Buddhist monks in their saffron robes presided stoically over the long plank tables filling with gifts of growing mountains of rice. The Khmer are graceful, attractive people with beautiful children, goggle-eyed at the clumsy pale foreigners. Because of the sizable Russian presence in Phnom Penh, we were assumed to be "Soviets" and it was a great crowd-gathering wonder when Judy responded to these whispered rumors in Khmer. On this first day in the city, I was struck by the smiling friendliness of the people and, knowing of the almost incredible hardships they have endured, marveled at their strength and resilience. Later the three of us walked the warm dark streets from a Khmer restaurant on the Mekong, the darkness scented by the thousands of small cooking fires that provided the only illumination amid the rushing bicycles and cyclos.

Over the next few days we were involved in rounds of meetings with government officials at the Ministry of Culture, while I fumed inwardly in frustration at my inability to get to grips with the collections. There were also difficulties in tracing the consignment of conservation supplies shipped months earlier, and in locating any kind of suitable equipment and tools. These petty irritations were placed in perspective, however, when I visited a temple in the country outside the city where the skulls of five hundred victims of the Khmer Rouge were piled, and was taken to the infamous Tuol Sleng interrogation center.

Tuol Sleng, now the Museum of Genocide, is a former high school wherein the teenagers of the Khmer Rouge tortured to death some thirty-five thousand men, women, and children. Numbed by the incomprehensibility of it all, I sorted through six thousand photographs of victims, my tears no doubt greatly exacerbating the mold damage to the Fuji safety film negatives. The archives, mainly handwritten and typed confessions, are stacked in flat folders in glass-fronted cabinets. There are approximately ninety-five thousand documents in generally sound condition, with remarkably little insect damage, doubtless due to the presence of mothballs in the cabinets. As in all the buildings housing collections I was to visit, air circulates by way of unglassed, unscreened windows—through which insects, birds, and bats also freely pass. Several studies have demonstrated the vital importance of free air circulation in the prevention of mold growth, often despite high temperatures and humidity.[3] The only severe mold damage I noted in Cambodia was in the photographic negatives housed in steel filing cabinets at Tuol Sleng,

[3]Mary Wood Lee, *Preservation and Treatment of Mold in Library Collections with an Emphasis on Tropical Climates: A RAMP Study* (Paris: UNESCO, 1988). This excellent study by a paper conservator addresses some of the fundamental principles of mold prevention in tropical climates and has some valuable caveats concerning the use of fumigants.

A section of the Tuol Sleng Museum of Genocide showing some of the thousands of confessions made under torture.

and in the palm leaf manuscripts housed at the Royal Palace.

The Royal Palace, now a museum, is really a series of magnificent structures. The famous Silver Pagoda and its neighboring terrace were formerly used for performances of classical Cambodian dance. (The dancers and their teachers were "decadent," thus exterminated by the Khmer Rouge. A few days after my palace visit, I was exhilarated by the dance performance of small children, all orphans, taught by teachers from abroad.) A Polish team of conservators was working to restore murals and fresco-like wall paintings within a cloister structure in the palace yard, more tangible evidence of the assistance provided by Eastern bloc countries. The palace manuscripts are stored in glass-fronted cabinets, but in a small building totally lacking climate control or any form of air circulation. The palm leaf manuscripts are severely damaged by insects and mold.

Palm leaf manuscripts are made from mature palm leaves approximately forty-eight-by-four-centimeters. The writing is sometimes applied directly to the leaf, but more often the characters are incised with a point and a mixture of lampblack and oil is rubbed into the engraving. The bundles of leaves are bound together by braided cords threaded through one or two holes about four centimeters from the ends, the "volume" being secured by heavy wooden covers at front and back. The volumes vary in thickness, but can be up to forty centimeters. While the texts, generally religious or collections of folk tales written in an old form of Khmer called Pali, are very old, the palm leaves seem to date mainly from the nineteenth century since the most practical preservation strategy had been con-

stantly to copy deteriorating manuscripts, a task traditionally performed by monks. Unfortunately, only a very small number of monks survived the Khmer Rouge and it seems clear that the manuscripts will have disintegrated completely before they can be copied in this way.

On probably the hottest day of the visit, John Badgley and I were privileged to visit the vast early twelfth-century temple complex of Angkor Wat at Siem Reap, the classical five-towered building portrayed on the flag of Cambodia. Although the Khmer Rouge had damaged some of the richly carved historical tableaux by machine-gun fire, the structure and that of the early capital of Angkor Thom were essentially intact. A great deal of conservation work is being done by an Indian team of building conservators, who brave possible guerilla attacks in their eight-year restoration project. The trip back from Siem Reap to Phnom Penh was enlivened by the overloading of the small Air Kampuchea plane (with three times its normal burden of passengers), and the somewhat erratic undulations of the flight.

The survey of the collections of the National Library and the National Archives was necessarily cursory given the time constraints. The National Library building was constructed by the French in 1913 and sited next to the National Archives amidst an ornamental garden. The library building is in extremely poor condition, without a water supply and with eccentric and dangerous electrical wiring. Much less than 20 percent of the collection survived the Khmer Rouge, who threw out and burned most of the books and all of the bibliographic records. The library was used as a pigsty for the duration of the Khmer Rouge regime and, of the original staff of forty-three, only three survived. Large mounds of books are

Palm leaf manuscripts at the Royal Palace, guarded by the caretaker's granddaughter.

piled in the storage areas, many rescued from the streets and markets, or private citizens. A lone, courageous Australian librarian, Gail Morrison (really a Scot from Aberdeen), works doggedly to catalog the books, sans OCLC, RLIN, Library of Congress classification schedules, National Union Catalog, or even three-by-five-inch cards. Mrs. Morrison has no authority over any of the staff, who lack education, training, and coherent job descriptions. The library has no written policies of any kind, no resident director, and no funding. Staff are paid as little as $1 per month and supplement their pay and rice allowance by growing fruit and vegetables and maintaining cattle in the "ornamental" gardens. Large piles of multiple copies of books supplied by the Soviet Union (e.g., Khmer translations of Marx and Lenin) lie untouched, unprocessed, and undistributed to regional libraries because the library has no transportation. A large collection of palm leaf and paper manuscripts were being sorted by a library assistant, and seemed a likely group of materials on which to begin the task of preventative maintenance.

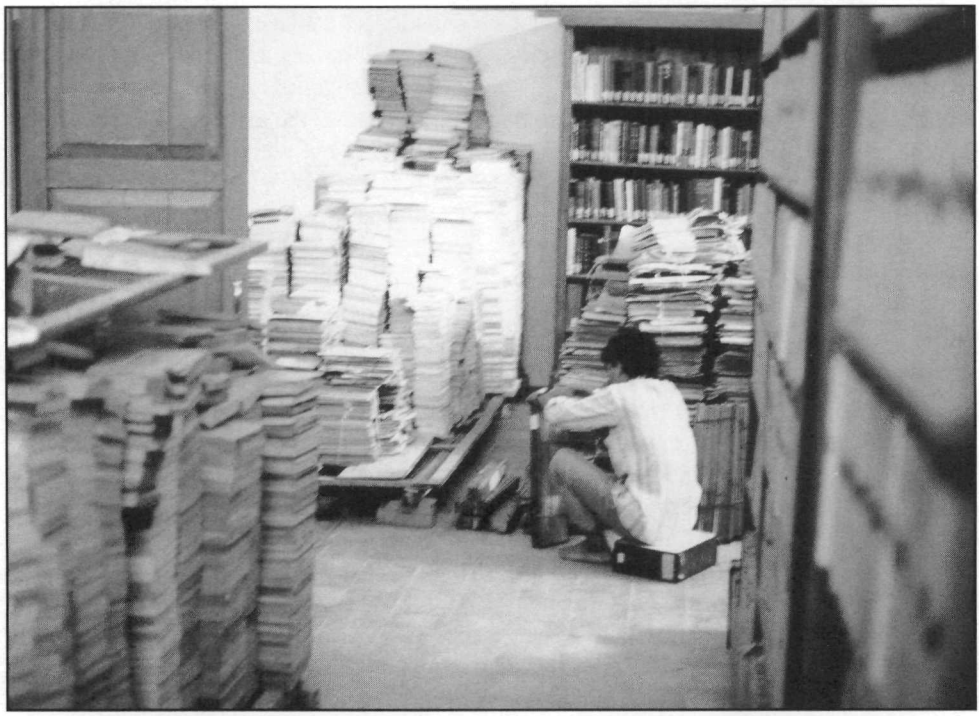
The National Archives is housed in a well designed but poorly maintained building. In general, the archives seems to have been better supported than the library, possibly because it is under a different ministry. The records appeared mainly French Colonial, kept without folders in the original boxes on library-type shelving. Much of the paper seems brittle, and the boxes are made from acidic pasteboard, starch-filled cloth, and starch and protein adhesives. Almost every box I examined had been badly damaged by insects, much more so than the records themselves. The staff had the impression that the ubiquitous silverfish were responsible, but the nature of the damage seemed to indicate termites and beetle larvae. (Although he disagreed with my diagnosis at the time, the chief archivist presented me with a handful of squirming maggots mixed with box fragments as a going away present!) Insect damage is clearly of great concern to librarians and archivists, but some of the fumigation attempts are extremely hazardous. At the archives, DDT was used extensively but without useful result.

I was also able to review the library collections at the National Museum which included several hundred palm leaf manuscripts from the old Royal Library and several thousand photographs and glass plates. While conditions at the museum seemed somewhat better than at the library, archives, and palace, the collections are still largely uncataloged and in need of preventative maintenance. Each week Mrs. Morrison catalogs for two days at the museum and four days at the library, but is the only person qualified to do so.

Staff Training

A technical processing room at the National Library seemed the only suitable place for a conservation work area, so with help from two staff, I cleared it of some 2,000 books, and appropriated a nine-by-four-foot table from the reading room. This was blocked up to a useful work height of thirty-eight inches, and a search begun for local equipment. Though I searched through two government print shops and two large markets, I was able to secure only a small office guillotine. After some trying moments at the customs warehouse, I was able to transfer many of the conservation supplies to the library and cut some of the materials to manageable sizes with knife and scissors.

The original strategy had been to survey the collections of the library; develop priorities for action; establish work areas; train library staff in fumigation, cleaning, repair, and enclosure techniques; determine the feasibility of establishing a Cornell microfilming operation; assess collection care and storage needs; and provide a general evaluation with recommendations on future preservation/conservation needs. The sur-



An elementary furbishing project involving dust removal from palm leaf manuscripts.

vey had, of necessity, been expanded to encompass the collections of the Tuol Sleng Museum of Genocide, the Royal Palace, the National Museum, and the National Archives, in addition to the National Library. It had proved impossible to fumigate materials prior to other treatment because of the lack of local facilities, equipment, and materials, and my inability to penetrate some of the layers of protocol. (Although I knew beforehand that vacuum chambers and chemicals probably would not be available, I had hoped to combine some of the resources of an ice factory and soda factory to utilize freezing and/or carbon dioxide to kill insects without endangering human health.) I had reached the point, after eleven days in Phnom Penh—and only seven working days remaining of my visit—where intensive staff training had to begin.

Since the initial period of training had to include representatives from several institutions, I proceeded with a system combining demonstrations of a variety of basic techniques with intensive repeat training of two staff from the library and two from the archives. In this way, the "audience" of twenty-two would benefit from the interpreted demonstrations, and key staff would be able to develop some basic skills. We quickly covered book repair, simple paper treatment and repair, encapsulations, and a variety of enclosures, and proceeded to the main point of the training, the cleaning and enclosing of manuscripts.

Two types of manuscripts cases were designed for the library and archives. The first, designed for palm leaf and mulberry paper manuscripts, involved both a flexible case for each manuscript and a sturdy box for groups of cased manuscripts (see Appendix 1, Palm Leaf Manuscripts). The second, designed as a replacement document case for archives, assumed groups of folded rec-

Staff of the National Library during training to produce protective enclosures.

ords, and is a sturdy drop-front box (see Appendix 2, Drop-Front Box).

The materials used include chemically sound board, with buckram and adhesive not considered palatable to insects (see Appendix 3 for a list of conservation supplies used). For both types of box, compartments were installed to permit the use of insect repellents.

The group worked enthusiastically and diligently, although the intense heat made the tools and materials slippery with perspiration. By the end of the five-day group session, I had moved to a supervisory role, and on the final two days before my departure was able to concentrate our efforts on the palm leaf manuscripts, a good many of which were enclosed. During the training and supervision, language differences became less and less important as the routines became more established and my ability to communicate through gestures improved. Almost incidentally, the basic principles of handling and shelving were addressed as we replaced the enclosed materials.

During the many hours of work with the Cambodian staff, I was greatly impressed by their grace and kindness, and our farewells were prolonged and emotional.

Conclusion

Although parts of the visit were somewhat frustrating and incomplete, the project was extremely successful in achieving its fundamental objectives. A number of recommendations emerged from the final report and many have been acted upon.

In October 1989 Judy Ledgerwood established the microfilming operation strongly urged in the report. Designed to ensure the the survival of greatly endangered texts and the extension of access, the task is to film all the palm leaf and mulberry manuscripts

Staff of the National Library and the National Archives learning the use of metric measurement formulae to construct inner enclosures.

and the entire archive of the Tuol Sleng Museum of Genocide. The microfilm camera, a Kodak model E class II, was carried into Cambodia by Judy, and the operation set up in the former library director's office, which has been equipped and climate-controlled by Cornell and the Luce Foundation. The first group of film has been processed and reviewed at Cornell and pronounced satisfactory according to standards set by the Research Libraries Group, Inc.

Through the generosity of the Reynolds Foundation, additional conservation supplies have been shipped to the National Library to ensure the completion of the enclosure project. But a great deal remains to be done if the Cambodian archives and national bibliography are to survive, both in the short term (such as the urgent duplication of the rapidly deteriorating photographic collections at Tuol Sleng and elsewhere), and as part of a more general plan of development.

At present there are no conservation facilities adequate for even the most basic book and paper treatments in Cambodia. There are important and unique collections, a growing readership, a detrimental climate, and extensive war damage. Not surprisingly, Cambodians are adamant that materials not leave the country for treatment, and Western nations continue to refuse admittance to Cambodians seeking training and education. It seems clear that some support must be given to the establishment of basic conservation and binding facilities in Cambodia. Building structures are poorly maintained, overall environmental conditions unsatisfactory, and collection storage methods deficient. Relatively simple strategies, such as installing insect screening and ceiling fans and providing

good housing supplies, would bring significant improvement.

Insects pose a real and continuing threat to collections in Southeast Asia and in other tropical areas of the world. The desperate use of hazardous chemicals has only temporary effect on insect populations, but can have long-lasting or permanent detrimental effects on collections and people. For example, there are reports that entire areas of the national archives of Vietnam have been abandoned because of repeated chemical contamination and its carcinogenic effects on staff. In Cambodia, the installation of a low-temperature freezer facility (for destroying insects by blast-freezing) coupled with a safe insect repellent could contain the problem. Research soon may be underway at Cornell to develop a natural repellent capable of safe and direct application to library and archive materials.

The entire managerial and educational structure of Cambodia was destroyed by the Khmer Rouge, who systematically murdered all educated people. To be literate was to be condemned to summary and brutal execution. At present it is difficult to see how policies can be developed for the library, how staff can be educated and trained, how the library's basic roles can be defined and realized, and how the collections can be made physically and bibliographically accessible to a population thirsting for them.

In Cambodia, we see the role of the library at its most fundamental and, because of the impossibility of fulfilling it, its most tragic. The painstaking creation of elementary school textbooks seems an insuperable task without the resources of a library, the self-examination of historical research doomed without archives, yet these are very real dilemmas in Cambodia. Modest action is being taken now to save some endangered materials, but a fundamental change in the international political climate will be needed before these problems can be addressed.

Appendix 1

Palm Leaf Manuscripts: Stabilization in Original Format

The following procedures are designed to stabilize palm leaf manuscripts. No attempt is made here to address remedial treatment, such as repair or surface cleaning, but some form of fumigation should be done before stabilization work begins.

The stabilization procedures fall into three main stages:

1. Securing the leaves. After fumigation, the manuscripts should be gently dusted to remove any surface dust and insect parts. The original ties should be carefully loosened and examined. Whenever possible they should be retained, but if broken and deteriorated, should be replaced with a soft-fibered string of the same thickness. If the original wooden board covers are missing, basic protective board covers should be substituted. Chemically stable boards, such as blue/white barrier board (0.060″ thickness, 32″ x 40″) should be cut 0.5 cm longer and wider than the manuscript. Make holes in the board corresponding to the manuscript holes. Thread the ties through the holes and gently tighten them (figure 1 shows a typical size). The board is larger to protect the manuscript's ends from damage, to prevent the ties from cutting into the manuscript edge, and to allow the end to be retained.

2. Making the manuscript case. The boarded manuscript is cased using a thin stable board such as Archivart library board (0.020″ thickness, 28″ x 42″). The width of the case is three times the width of the boarded manuscript plus twice its thickness. Lightly score and then fold the board (see figure 2). Cut a flap for each end of the case. The width should be 0.1 cm less than the width of the case, and the length should be 5 cm. plus 2 cm plus the thickness of the case (see figure 3). Glue the flaps in place and insert the boarded manuscript.

3. Making the box. The separate manual guide describes the box-making formula which should be followed here. Starch-filled cloth or buckram should not be used, nor should starch paste or animal glue. Pyroxylin coated/impregnated buckram used with Elvace polyvinyl acetate adhesive is the most suitable material. In general, the cased manuscripts may be boxed in fours or sixes. Each box should accommodate some form of insect repellent, such as naphthalene or para-dichlorobenzene mothballs or crystals in a sachet, or a small piece of Shell No-Pest strip. To accommodate the repellent, it is usually best to make the box slightly longer and include a board separation (see figure 4), the actual size of the repellent compartment dependent upon the type of repellent used.

Conclusion. As time, materials, and trained staff permit, work on cleaning and repairing the manuscripts should begin. This is a time-consuming process that must be done with great care. The stabilization procedures described above will provide indefinite security for the manuscripts, particularly if the insect repellent is renewed periodically. When full remedial treatment has been done, the same cases and boxes may be reused.

Text and illustrations derived from instructions prepared by the author for the Cambodian archivists and librarians.

Figure 1.
Manuscript with protective board and ties.

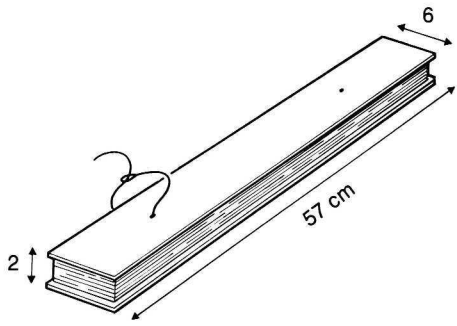
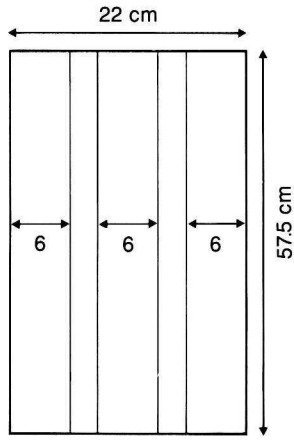


Figure 2.
Library board or stiff file folder stock cut and folded.



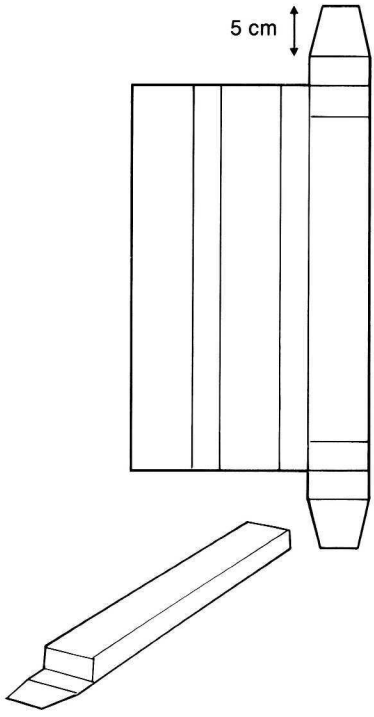


Figure 3.
End flaps glued into position and the case folded and secured.

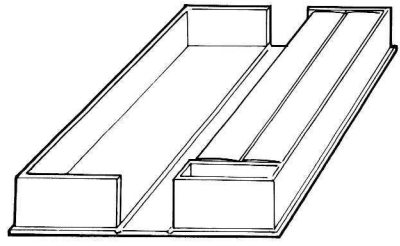
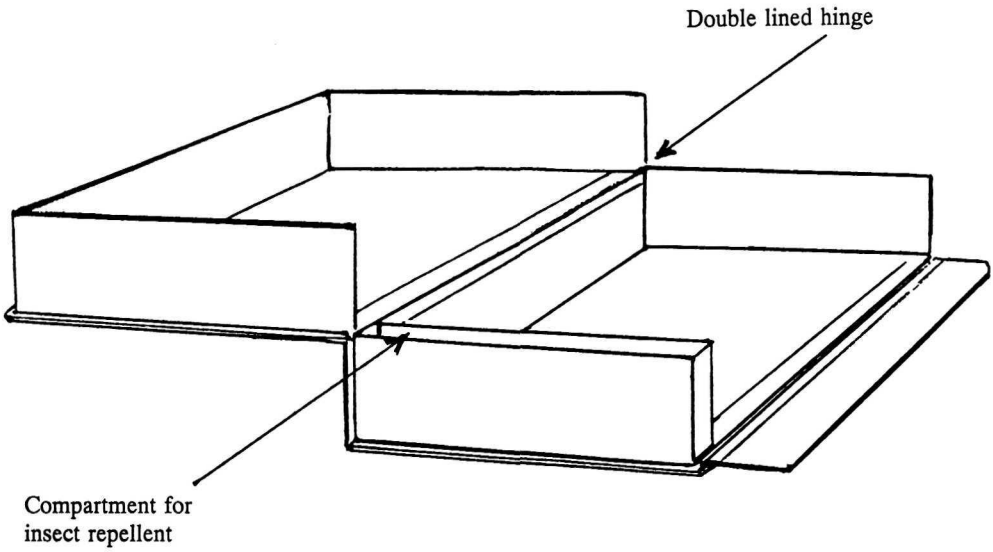


Figure 4.
The manuscript cases secured in a folding box (usually two or four per box). Note insect repellent compartment.

Appendix 2

Drop-Front Box for Documents



Materials

Upper and lower tray compartments: blue/white barrier board
Outer case: Davey Red Label binders board
Cover material: Group F pyroxylin-impregnated buckram
Lining: Archivart library board

Illustration by author.

Appendix 3

Conservation Supplies used in Cambodia

3 - 80-yard rolls Group F pyroxylin buckram
1 - 100-foot roll hinge cloth
1 - 100-yard roll Melinex polyester film
1 - 5-gallon pail Elvace polyvinyl acetate adhesive
1 - 55-gallon drum Velverett polyvinyl acetate adhesive
350 - 0.060″ thickness blue/white barrier board, 32″ x 40″
500 - 0.020″ thickness Archivart library board, 28″ x 42″
600 lbs. 0.074″ and 0.098″ thicknesses Davey Red Label binders board, 27″ x 38″
80 sheets Kizukishi Japanese tissue, 24″ x 36″
72 Shell No-Pest Strips (used as repellent)
10 kilos. para-dichlorobenzene (used as repellent)
5 lbs. silica gel
100 plastic gloves
10 rolls double-sided tape (3M 415)
2 spools linen thread (no. 18 and 35)
1 large, 3 small glue brushes
Bone folders, sewing needles
Steel rulers and scissors