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**CONSERVATION AND DIGITIZATION  
AT THE BUDDHIST ARCHIVE OF PHOTOGRAPHY IN LUANG PRABANG, LAOS**

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**ABSTRACT**

The Buddhist Archive of Photography is a steadily growing collection of photographs that is based in Luang Prabang, the historic royal city in the heart of Laos. Having recognized that the photographs taken by local monks over the past 120 years form an important part of the cultural and religious heritage of the many Buddhist monasteries within the city, the late Venerable Abbot Phra Khamchan Virachitto founded this archive in 2006/2007. A pilot project and two consecutive Major Research Projects of the Endangered Archives Programme of the British Library allowed for the examination of the situation of the many thousands of photographs in the Luang Prabang monasteries, the invitation of a photograph conservator to Luang Prabang to act as a consulting expert in the ensuing conservation efforts, and the establishment of a functioning photograph archive with a digitization program at the monastery of Vat Suvanna Khili. This article describes a survey of the collections in the monasteries, the implementation of improvements in digitization methods and storage facilities, and basic handling and conservation efforts. Local materials and craftsmen were used exclusively for designing the storage enclosures and facilities of the archive, and, with the help of a selected number of young Lao men who had once served as monks and novices, a practical Lao-English dictionary for terms of photograph conservation was established. The outlook lists the challenges that will need to be addressed to maintain this small but important archive in a tropical setting in the future.

**INTRODUCTION**

Since the summer of 2006, the historic city of Luang Prabang in northern Laos has been witnessing increasing activity in the field of the preservation of photographs. A number of monks and abbots of the many Buddhist monasteries in the city have been taking and collecting photographs for many decades, resulting in a significant but yet hidden treasure trove of the photographic history of Laos. Phra Khamchan Virachitto, highly venerated Abbot of the monastery Vat Saen Sukharam from 1920 to 2007, was one of the most learned and influential abbots in Laos, and he was also the central figure in the ensuing projects that led to the founding of the Buddhist Archive of Photography in 2007 (Fig. 1).

Holding over 20,000 photographs today, the archive covers approximately 120 years of Buddhist photography. Since photography's early times, Luang Prabang, as a royal city, has had an élite of learned people who loved creating and collecting photographs. From his young age, the Venerable Abbot had been one of them, and he was in a position to uphold his collection even during the times when the possession of images linked to the past, royalty, or certain relig-

ious practice represented a danger – and when most members of this élite perished or went into exile. The photographs have escaped loss, dispersion and arbitrary destruction that have afflicted many historic collections of photography in South East Asia as a result of this region's extraordinary political and social changes in the 20th century, only because the Venerable Abbot, who for more than 70 years had been a collector of photographic documents, found ways to astutely gather, protect and, for many years, hide the archive from any intrusion and inspection by outsiders.

A particular quality of the material lies in the fact that it offers a view from the inside: all photographs were taken by Buddhist people involved in the ritual life of the city or by monks who documented their own world with a camera. The archive therefore shows a perspective that differs greatly from western ethnographic photography of the past or from the type of photographic reportage we know of today.

The important and vulnerable material found in the monastery has always been highly endangered. Curiously, the fact that few people know about it represented one of the biggest threats: lay people and monks of the monastery did not know how to deal with the material or how to resist possible commercial interests in the older photographs. The photographs have also suffered from the ravages of a tropical climate and excessive handling over the years.

Aware of the significance of this collection and the imminent dangers facing it, German photographer Hans Georg Berger in 2005 asked the Venerable Abbot to permit him to apply to the Endangered Archives Programme (EAP) of the British Library, London, for funding to protect the photographs from their sure destruction. A pilot project was approved by EAP, and two field research periods (July/August 2006 and January/February 2007) were carried out, during which the situation of the many thousands of photographs was examined, talks were held between the organizers, relevant Lao government agencies, and the monks, and a small team was formed. The pilot project team started to interview the Venerable Abbot on the contents, age, and significance of the photographs during the research periods. He was able to identify most of the depicted persons and readily communicated his knowledge to the members of the team, all of whom were former monks who had been ordained by him. Part of the urgency for this work related to the extraordinary chance to conduct these interviews, since it would be impossible to acquire this contextual information at subsequent occasions.

With the success of the pilot project, EAP awarded funding for a first Major Research Project to Hans Georg Berger that ran from July 2007 to June 2009. As a photograph conservator, I was asked to participate as a consultant in the conservation efforts during the month of July 2007, and I returned to help wrap up the project in June 2009. Shortly before this first project ended, funding for a follow-up EAP Major Research Project was procured by Mr. Berger. This new situation will enable the archive to function and continue to grow until mid 2011.

Apart from securing the original material from loss, theft, and deterioration, the archive has focused on digitization of the photographs as a measure of rescuing at least the images



Fig. 1. Venerable Abbot Phra Khamchan Virachitto, aged 73, with alms bowl and meditation tent at Vat Pha Pon Pao, 1993. (EAP.A0174, Buddhist Archive of Photography, chromogenic print)

through reformatting. Digitization will also allow for accessing the photographic images without having to touch the originals, many of which are very fragile. Access to the digital images and to information on the archive's holdings will be given through the Buddhist Archive itself, the National Library of Laos in the capital, Vientiane, and the British Library's Endangered Archives Programme in the future. The National Library of Laos, the project's official partner from the side of the Lao government, and the British Library will hold full sets of digital copies and listings of all of the catalogued photographs. The British Library will be responsible for the long term updating of the digital data. A starting point for researchers is the EAP's website at [www.bl.uk/about/policies/endangeredarch/homepage.html](http://www.bl.uk/about/policies/endangeredarch/homepage.html).

One of the most important aspects of the research project has been the involvement of abbots and monks of the other monasteries; it has thereby found acceptance within the Buddhist community of monks, the "sangha". As it turned out, photographs were present in many monasteries in large numbers; these prints could also be secured. An important outcome of the research has been the preparation of biographies of the collecting monks and abbots and of histories of the respective monasteries. Finally, the images have been and will continue to be used to educate novices and laypeople in Laos on their heritage through a calendar and other planned publications such as schoolbooks.

At the beginning of the pilot project, in 2006, the Venerable Abbot was 86 years old. He hoped that the activity of the research team would enhance the sensibility of local townspeople for the significance of the collection, thereby making it more difficult to neglect or disperse his collection after his death. The Venerable Abbot's own intentions for the future use of the archive match those of the EAP project. On several occasions, he indicated that he had two motivations for the establishment of the archive: to preserve, in highly difficult times, the spiritual strength, uniqueness and beauty of Lao Buddhism for the Lao people of future generations, and to communicate the singularity of Lao Buddhism to people all over the world.

#### A SETBACK AND AN INCENTIVE

In 2007, I was honored to have an audience with the Venerable Abbot Phra Khamchan on my first day in Luang Prabang. Having been instructed on appropriate etiquette, I sat on the floor of his quarters at Vat Saen as he received my compliments, then he spoke to me through a translator for twenty minutes. Only two hours later, as I was looking through the first boxes of photographs, I was informed that the Abbot had just passed away. The whole town was stunned, and at the same time it was buzzing with energy and apprehension. The room with the photographs became out-of-bounds to aliens like myself, as valuable temple objects were locked away to protect them for the next two weeks, during which hundreds of lay people and monks came to pay their respect to the Abbot. This period ended with a fantastic funerary parade and cremation.

With the collection in Vat Saen inaccessible, but with a strengthened sense of immediacy and importance of carrying out the Venerable Abbot's will



Fig. 2. This building at Vat Khili houses the Buddhist Archive of Photography.

to preserve and protect the historic photographs of Luang Prabang Buddhism, we decided to carry on with the project as best as possible: preparing everything so that once the collection became available again, the structure of the archive would be ready for it and work could commence. In the nearby monastery Vat Suvanna Khili the second floor of a building built in a mixture of French colonialist and traditional Lao architecture (Fig. 2) had been assigned to the project as a work space. Meanwhile, the sangha decided to permanently dedicate it to the Buddhist Archive of Photography.

The novices were very curious of our doings, and word spread throughout the monasteries that two foreigners, Mr. Berger and myself, along with three former Lao monks were searching for photographs. As a result, we began to receive photographs of all kinds from a large number of the town's monasteries. At the same time, official contacts were made with the leading abbots, who then granted permission for us to enter the living quarters ("kutis") and other monastery buildings, some of which had not been accessible for more than 20 years. Many of them did contain historic photographs. This was a wonderful development, since it showed us how widespread and common photography was in Luang Prabang. It was also, for all involved, a tribute to the Abbot's endeavor to unite the photographs of the region and protect them from being lost, stolen, or destroyed.

#### SURVEY OF THE COLLECTIONS

We had decided to schedule my first, one-month trip to Luang Prabang in 2007 at the very beginning of the project in order to acquaint the local team with my suggestions as early in the process as possible. A survey was carried out to find out more about the photographic processes, formats, quantities and conditions of the photographs in the collections of four monasteries of Luang Prabang. The survey was the basis for subsequent decisions on storage needs such as sleeve and box formats, quantity of enclosure materials to be ordered, the configuration of the Excel lists that we used to catalogue the collections, and the teaching of photographic processes to the project staff. With additional information from the ongoing work of the following two years and the growing holdings of the archive, the following summary of the collections as they stand in July 2009 can be made:

So far, photographs and related materials have been collected and examined from 13 monasteries and from two private collectors. While the subject matter ranges from the 1850s to 2009, the earliest prints found are from the 1890s (some photographs are reproductions of older images or paintings). The final number of the photographs in the Buddhist Archive cannot be given yet, since photographs are still being found in a number of monasteries in the city. However, over 15,000 prints were identified, cleaned, registered, digitized, catalogued, and stored in sleeves and boxes during the first two years. The large part are silver gelatin fiber-based prints and chromogenic RC-paper prints. Some silver gelatin RC-paper prints and chromogenic fiber-based prints were also found. Further processes include dye diffusion instant



Fig. 3. An assortment of photographs from the collection of Vat Saen Sukharam

prints, letterpress halftone prints, collotypes, rotary photogravures, and digital prints such as ink-jet and electrophotographic laser prints. A few rare processes such as cyanotypes and photographs on porcelain plates were found. Some original paintings and some printed matter (book pages, certificates) were also accepted in the archive due to their contextual relevance. Over 1000 negatives were found; they include silver gelatin on glass and film in various formats. Chromogenic negatives and framed 35 mm color transparencies are also present.

The photographs were found loosely assembled in envelopes, plastic bags, and boxes, stacked in cabinets and in drawers, displayed in frames or albums (Fig. 3). Some individual album pages were simply nailed to the walls of the novices' living quarters. Many of the 35 mm negative strips were in the plastic or glassine sleeves supplied by the photo lab.

### General Condition

In general, gelatin silver prints showed deterioration appropriate to their age: signs of use such as tears, folds, fingerprints, and surface dirt, and slight to moderate silver mirroring and fading. Termite and silverfish damage was extensive on these prints, but only seldom found on the chromogenic prints, presumably due to their RC-paper base. Mold growth was also more common on the gelatin silver prints, and it was often found in conjunction with water damage, leading to a powdery and stained emulsion and support. Most of the serious damage was water-related, either through the prints becoming wet or simply being in a humid climate for many years. Chromogenic prints from the 1970s through to the 1990s had suffered moderate to extensive color shifts towards red. Kodachrome and Ektachrome slides in respectively labeled cardboard mounts from the 1970s showed how stable the former can be: while the Kodachromes have only a slight bluish tinge, the Ektachromes have faded severely to a light red.

### Frames

In every collection we found photographs in frames on the walls of the monastery buildings. They were, for the most part, in very poor condition, since they have been exposed to light, dust, water, environmental fluctuations, mold, and insects over many years. As a result of prolonged humid environmental conditions or liquid water leaking into the frames, about one third of the framed photographs have become partially adhered to the glass. Often, this problem is also the result of severe buckling of the print and its support and the lack of a window mat or spacers within the frame. Some of the frames had irregular backings: narrow plates of glass were used as a support, and this had caused irregular pressure on the back of the photograph, which in turn led to it adhering to the frame glass. Many of these prints also showed mold damage to the emulsion and the support. In one case, the paper support had deteriorated to the extent that it was impossible to open the frame without causing the disintegration of the paper and thus the loss of the image in that area.

None of the frames were sealed on the verso, so that dust and insects were able to enter and cause severe losses and disfiguration of the images. The losses caused by silverfish and other insects will continue unless the prints are unframed and stored safely. The common practice of creating a collage of many small prints in a frame (Fig. 4) is problematic in that some of the pictures invariably fall away from their original location while others adhere to the glass. These factors made it difficult to find a solution that would ensure the preservation of the images while respecting their original order and context.

The abbots expect to re-hang the prints in their original locations following their digitization. For these cases, the replacement of the original photograph with a duplicate would be the most sensible option from the point of view of preservation. It became clear, however, that some of the original photographs will have to be re-framed and re-hung. This is unfortunate in that they will then once again be subject to the agents of deterioration described above. In addition, the risk that they will simply disappear cannot be addressed once they have returned to their original monasteries.



Fig. 4. Frame from Abbot Phra Khamfan Silasangvaro's living quarters at Vat Suvanna Khili

### Albums

A variety of albums were encountered. The historic albums have black paper pages and thin glassine tissue as interleaving sheets. Some, more modern, black paper albums, however, have a plastic sleeve that is folded around the outer edge of the sheet, in a manner similar to that of the sticky albums (described below). The photographs are adhered to the pages with an unknown glue, either in the corners or overall. Some of the photographs are loose and easily fall out and become damaged or lost when the album pages are turned. The photographs in these albums are, in general, in good condition.

The PVC-type albums have pages that are made entirely of poly(vinyl chloride). Prints up to 9 x 13 cm are inserted into sleeves on both sides of each page. Almost all of the prints have partially adhered to the PVC. In most cases it was possible to separate the prints by simply inserting a pointed bamboo spatula, but where water had entered the sleeves the emulsion stuck to the PVC so firmly that it could not be removed. This was also the case for the color halftone prints, which had stuck overall to the plastic. Water led to the complete dissolution of the emulsion in some cases. Physical damage occurred where the prints had partially slipped out from one sleeve and into the adjacent one: when the page was flexed the print was creased and the emulsion delaminated.

Small and simple plastic albums encountered in the collections are typical for the 1980s and 1990s. They were generally used for the display of prints of only one film, up to the format of 10 x 15 cm. The pages are simple plastic sleeves (usually cellulose acetate) stapled to the cardboard cover at the spine. Prints are inserted back to back into the sleeves through the open top edge. The cellulose acetate has shrunk and channeled to a great extent in most of the albums, but there was no smell of acetic acid. Many of the prints have adhered to the inner surface of the sleeves, but they were very easily removed.

The sticky albums have cardboard pages that are coated overall with thin, horizontal lines of adhesive on each side. The prints are laid down onto the adhesive and then covered with a plastic sheet, commonly of cellulose acetate. As the albums aged, the adhesive hardened and lost its tack, and the plastic cover often fell loose. The plastic itself seemed to have caused no problems to the prints; on the contrary, the prints were well protected by the acetate sheets. Due to the

failing adhesive, however, some prints simply fell out of the albums or could be easily pried from the page surface with a bamboo spatula. A large number of the prints, on the other hand, adhered ever firmer to the pages and could not be removed.

### BASIC TREATMENT

During the survey of the collections it became clear that a fair number of the photographs were in very poor condition and would benefit from conservation treatment. The treatment would serve to stabilize the objects to the extent that they could be handled by researchers without being further damaged, and that they would not deteriorate on their own once they had become part of the Buddhist Archive of Photography. Only the most basic treatment was carried out on the photographs, since more difficult, though equally pressing treatments would have required more time and equipment. Conservation treatment will be part of future work within the archive. The following steps were taught to the Lao staff so that they could carry them out on their own:

- Since virtually all of the items were dusty or dirty, it was important to give them a basic surface cleaning before placing them into their new, clean, paper sleeves, boxes, and cabinets. In addition, cleaning is an important prerequisite for high quality digitization. For most of the objects, this step consisted of a simple brushing of the recto and verso surfaces with a clean, soft, wide brush. The brushes had been purchased from a local hardware store. Cleaning of the very dirty items was carried out in a separate area from that of digitization and sleeving in order to avoid contamination. Most of the frames were very dirty; in consequence, they were first cleaned externally near a window in the fore room, then opened and cleaned on the inside as well.
- Superficial mould growth was removed with an Absorene Dirt Eraser sponge, which I had brought to Laos from Germany. Mold that was embedded in the emulsion or support could not be removed by this method, and no disinfection was carried out.
- A full treatment such as mending tears with Japanese paper or lining very fragile prints was not possible in the short period of my stay. For this reason, following their surface cleaning, fragile objects were simply placed in a double sleeve in order to physically stabilize them. The front of the outer sleeve was inscribed in Lao and English with a warning against handling, and the need for conservation was entered into the catalogue so that these items could be identified and retrieved for treatment at a later time.
- Removal of prints from PVC sleeve albums and sticky albums was carried out with fine micro-spatulas, each with different tips, which were carved from bamboo.

### CATALOGUING

One of the most important issues to address at the beginning of the project was that of the ordering system for the photographs of the different collections. The hierarchy that was adopted was based on EAP's "Guidelines for Listing Copied Material" (Endangered Archives Programme 2006), and its system was used throughout the conservation, digitization, and storage procedures:

- The Buddhist Archive of Photography is the general entity. It is divided into a number of collections.
- Each collection contains the items from one monastery or from one collector.
- Each photograph is given a unique EAP reference number, which is written in pencil on the verso and on its paper storage sleeve. The reference number contains a code letter for the collection that the photograph belongs to and a four-digit number. This system allows for a large number of further collections to be added to the archive over time.
- The photographs can be further sorted by keywords.

We chose Microsoft Excel for handling the large amount of cataloguing data. Excel is widely used internationally and is expected not to become obsolete in the near future. It works with a very simple table-based system that can be exported into other formats if necessary. The data entry spreadsheets were made with the software's *List* function. This allows for easy sorting and searching, and individual columns can be formatted differently: entries in two columns labeled "Description", for example, can be made in Lao or English script.

The description is one of the most important entries, since it describes the content and context of the image. The information gathered here gives invaluable insight into the history, culture, rituals, architecture, and persons of Lao Buddhism that cannot be found elsewhere. Following the Venerable Abbot's passing, Project Director Khamvone Boulyaphone took over the task of describing the photographs. He had been a monk under the Abbot for many years and knew many of the depicted persons and rituals; today he has become a respected personality within the Luang Prabang community himself. Where there were still open questions, he interviewed other monks and abbots. The descriptions were first written in Lao in order to capture the immediate essence of the photographs; they were later translated into English by archive staff.

For some columns, *dropdown* lists were designed that offer a restricted choice: this was useful, for example, for the columns "Keywords", in which only a pre-defined list of English terms describing the contents of the image (such as "Buddhist ceremony", "Pilgrimage" etc.) were allowed, and also "Original Medium", which contains the photographic process. This feature proved to be especially useful, as it guaranteed that only one spelling was used for the keywords, which did not have to be typed over and over again, a sure source for typographic errors in a language foreign to the archive's Lao staff. This enabled accurate sorting and searching. Excel's *List* function also allows for automatic totaling of the entries. The total number of catalogued items can be found at a glance, and it can also be seen how many of them have or have not been digitized. In the final version of the lists, each item had 15 fields for data entry.

## DIGITIZATION

Two methods are currently being used for the digitization of the items in the archive: scanning and digital photography. The small, desktop flatbed scanner can process reflection prints up to approximately 18 x 24 cm. Prints that are larger than this must be digitized with a digital SLR camera. At present, there is no procedure for digitizing negatives or transparencies in Luang Prabang; this task will be addressed in the future. Both of the digitization procedures were adjusted to result in the highest quality possible with this equipment and under the given circumstances. Workflows were standardized so that the results would be as consistent as possible.

The settings in the scanner software were optimized with a Kodak Greyscale Q13 target. The aim was to create a file with a histogram that shows that all of the details of the original have been captured in the digital duplicate. The use of the digital camera for digitizing larger formats was slightly more complicated, as we needed to use natural light for lack of suitable artificial light sources. A simple duplication stage was constructed out of greyboard. Positions for the stage and the camera tripod were marked on the floor with brightly colored tape with so that the set-up would always be reproducible (Fig. 5).

Since the quality of natural light is time and weather dependant and fluctuates greatly in color temperature and brightness, the use of the Kodak Greyscale Q13 is important for the calibration of the digital image. Using the camera's software, the digital images, taken in the RAW format, could be developed to optimize color balance and levels. The settings of the digital camera, the scanner, and the respective software were recorded in detail in a series of protocols, and backups are regularly generated on a number of external hard drives. Preservation copies are saved as uncompressed TIFFs. Access copies are then generated as JPEGs. All photographs were to be digitized in 24 bit RGB, but some black-and-white photographs were scanned in 8 bit greyscale. Some confusion also ensued due to the presence of two different Q13 targets, both of which have slightly different color casts. Despite the known disadvantages associated with these Kodak targets, we decided to continue working with one of the greyscale targets for the second EAP project in order to maintain continuity in our digitization procedures.



Fig. 5. The simple stage setup for digital photography of oversized prints.

## STORAGE SOLUTIONS

It was clear that it would not be possible to satisfy the usual requirements for the ideal storage of photographic materials given the circumstances in Luang Prabang. Nonetheless, it was important to keep them in mind as reference. Our goals for storage were set as high as possible for the given situation, but it was important to retain a certain amount of flexibility and inventiveness in our interpretation of the common guidelines. The new storage conditions are a great improvement to the prior ones, and it may be possible at some point in the future to further improve the situation.

Luang Prabang has a year-round tropical climate, with a humid summer and a dry winter. Summer days range from mid 20s to low 30s (°C) and relative humidity values between 70 and 90%. The rainy season (June through September) brings much precipitation and especially high levels of humidity. The first half of the dry season (November through February) is cooler, with temperatures ranging from mid 10s to mid 20s (°C) and RH values between 60 and 75%, while the second half (March through May) can get very hot and dry; it is during this period, especially, that Luang Prabang can become quite dusty as the dry red soil becomes airborne.

The archive's storage room has a number of unglazed windows that have slatted wooden shutters. These allow air to pass through the building at all times. This form of ventilation is advantageous in that it cools down the room and does not allow for areas of stagnant, humid air that might encourage mould growth. At the same time, however, it makes it impossible to control the passage of airborne dirt or influence weather-based fluctuations in temperature or RH.

Since a technical solution to climate control is not possible at this time, we decided to house the individual prints in paper instead of plastic sleeves. Although plastic sleeves made of polyester, polyethylene or polypropylene are chemically inert and give a better protection against handling, plastic has the disadvantage that it is largely impermeable to water vapor. Paper sleeves, on the other hand, allow for diffusion of water vapor throughout the storage units, which may be an important factor in an uncontrolled tropical environment. Many examples of prints that had adhered to their plastic enclosures were found in the collections, and we did not want to duplicate this situation.

The new individual sleeves are stored in paper boxes, which themselves are stored in wooden cabinets. Wood was chosen over metal early on in the project. Although wood is not recommended in climate controlled archives due to its potential for off-gassing acidic fumes that can damage photographic materials, metal poses severe problems in a tropical climate: at constant RH levels over 60%, the development of rust would be the main issue. Even powder-coated metal cabinets may have holes in their coatings. The prohibitive price of well-made, individually modified, powder-coated metal cabinets was a factor as was the fact that they would have to be imported. One of the most important reasons to use wood was that we would continue the tradition of a distinct style of cabinetry found throughout the monasteries, and that we would support local businesses with our orders. The bleak functionality of a powder-coated cabinet would have been out of place within the monastery surroundings.

It was decided very early in the project to use locally available materials for the storage of the photographs in the collections. The following factors were considered:

- Importing papers, boxes, and cabinets from overseas would have greatly increased the budget for the conservation of the collections.
- The papers available in Luang Prabang promised to be suitable, to a large degree, for the storage of photographs. This area of Laos is known for its production of Sa paper, made from the inner bark of mulberry trees growing in the forests in the region. In a process similar to that of the manufacture of Japanese papers, the inner bark is harvested, the fibers are separated, purified and washed with sodium hydroxide, then bleached to various degrees with hydrogen peroxide. The Sa paper sheets are made without any internal sizing. As a result, they are quite absorbent to water, but they proved to be surprisingly strong nonetheless. From the point of view of their composition, these papers are very pure.
- A local factory that we visited produced eight different grades of Sa paper. The papers were evaluated for their suitability for the storage of photographs by a pH test and a simple lightfastness test. Although a Photographic Activity Test would have been desirable, the expenses and logistics this would have involved were considered inappropriate for this project. The pH of each paper was measured both with an indicator pen and with the cold extraction method (TAPPI 2002); all papers appear to be near pH neutral (pH 7.0,  $\pm$  1.0). For lightfastness testing, I placed samples of the papers that I had received in advance behind a window with one half of each sheet covered. Exposure to daylight averaged 12 hours per day. After

ten weeks of exposure there was a slight bleaching effect in the exposed areas. This was evaluated as a positive result, since the inclusion of lignin or other impurities in the papers would have caused the opposite: a yellowing of the paper in light. Only three of eight, the brightest papers with the most uniform formation and smoothest surfaces, were chosen for use in the archive. Upon my return to Luang Prabang in 2009, two years since the boxes and sleeves had been made, I found that only some of the white papers had yellowed and developed foxing.

- It was thought that the use of materials and products from Luang Prabang would not only support the local economy, but also provide the archive with an internal sense of connection to its own basis: the local materials, markets, customs, and culture.

### Boxes

Two clamshell-type boxes were developed that would accommodate almost all of the prints found in the collections (Fig. 6). The smaller box is used for vertical storage of prints up to the format 10 x 15 cm; the larger box is for the horizontal storage of prints up to the format 30 x 40 cm. When stored together on one shelf, two boxes of each type match each other in their outer dimensions to save space. Over-size prints will be stored in a wooden flat-file cabinet that will be constructed in the second EAP project.



Fig. 6. A large, open spine clamshell box with prints in sleeves.

No thicker board of higher quality was available, so the boxes were made by the Sa paper factory according to our designs. Despite the use of relatively thin paper, these boxes turned out to be quite stable, though not made for transport or for storage of heavy objects. The floor, lid and walls consist of double or triple layers, and the adhesive used was a locally available polyvinyl acetate (PVAC) white glue. We decided against the use of a local rice starch for paste, even though it would have been more suitable in terms of purity and off-gassing, because it would have been very difficult to convince the paper maker to cook the paste regularly, the workers at the factory were accustomed to using the PVAC, and starch would have been a source of nourishment for mould and insects.

### Sleeves

Four standard sized sleeves were designed to fit into the two types of boxes. All of the sleeves consist of simply cut Sa paper with a single fold; for reasons of simplicity, purity of materials, and cost, no adhesives were used. The smallest sleeves, made of the thin Sa paper, are for the vertical storage of prints up to 10 x 15 cm. For ease of handling, stiffer inserts are made that are simple U-folds, with a 1 cm wide base strip. Six of these inserts fit into one vertical box, and approximately 14 prints fit into one insert, resulting in a potential total of approximately 84 prints in one box. For a small group of prints that belong together, a simple phase box is made individually. In this case, prints are simply interleaved with a tissue-like Sa paper. Larger sleeves are made from the thicker Sa paper to accommodate prints up to 30 x 40 cm. These are placed in

the flat boxes made for horizontal storage. These boxes can hold approximately 50 prints of the format 30 x 40 cm and up to 90 prints of smaller formats.

### Cabinets

Four cabinets were made during the first EAP project. Their design is based on that of traditional cabinets found in the temples (Fig. 7). The cabinets were made of tropical rosewood, a heavy and very hard wood found in Laos. In order to avoid the build-up of vapors from the fresh wood, all inside surfaces were coated with a layer of shellac, a good barrier for volatile organic compounds (Tetreault 1999). Depending on the way the cabinets are filled, they can hold up to approximately 120 boxes. To deter mold growth within the cabinets, holes were drilled near the top and bottom of the back panel to ensure adequate ventilation. All of the holes were closed with a finely meshed textile on the inside to ensure that only air, but no insects or dust enter the cabinet. There is also a 4 cm gap between the edges of the shelves and the outer panels of the cabinet. In addition, there should always be a small gap between the boxes on the shelves.



Figure 7. Left: historic cabinet for palm leaf manuscripts. Right: new archive cabinet.

### TEACHING

An important part of my work in Luang Prabang was teaching the local staff fundamental skills and a basic understanding of photograph preservation and archiving. We set aside special times for teaching units, and it was critical that each staff member take part in all of the units. At a later point, the individual members discovered their strengths and weaknesses and concentrated on an area most suitable for themselves. The topics of the teaching units were:

- Identification of photographic processes

Since it was necessary to provide information on the process of each photograph for the records, I used the results of the collection survey to prepare a workshop on the identification

of photographic processes. It was first necessary to explain fundamentals of photography. Luckily we had found some unused silver gelatin photographic paper in its original packaging in one of the collections, and with it I could demonstrate how a positive is created by contact with a negative under the influence of light: a negative was placed on the photographic paper, held flat by a sheet of glass, and this sandwich was placed in the sunlight. The image printed out and could be seen as a positive. We had no chemicals to fix the image, but the basic principle of the light sensitivity of photographic materials and positive and negative images could be shown to the local staff, all of whom belong to a generation only familiar with digital cameras and who did not know what a negative was used for. Following this, the characteristics and sensitivities of gelatin films and emulsions were demonstrated, and the processes that had been found in the collections were discussed with examples. Key identification factors were given for each process. One example of (almost) each of these processes was singled out from the collections for a didactic sample reference collection. In addition, a set of identification notes was printed out for reference.

- Basic conservation principles

Whenever we dealt with photographs, frames or albums, I tried to impress upon the staff the importance of conscious and correct archival practice. Principles of cleanliness were discussed. The overall presence of dust and the dirtiness of the prints themselves made the use of white cotton gloves impractical, however. The gloves became soiled and moist very quickly and would then only serve to pass the dirt from object to object. As an alternative, I taught the staff to only handle the prints by the edges and never to touch the surfaces. Large prints were only to be carried with two hands. Prints were only laid down on clean sheets of Sa-paper, since the table-tops were often quite dusty. The avoidance of accidents was also an important lesson; no drinks or other containers containing liquids were allowed on the table if a photograph, frame or album was present.

- Box- and sleeve-making

Although we had the boxes and sleeves produced by the paper factory, it was important that at least one staff member is capable of making boxes and sleeves by himself. For this reason, I taught Somlit Vongsavath how to measure, create right angles, cut, crease and glue Sa-paper. He also learned how to make individual phase boxes for small groups of photographs. The rulers and knives were bought in Luang Prabang; other tools were carved from bamboo.

- Unframing and reframing

Typical framed images were unframed and their components cleaned. The frames themselves were dusted and cleaned with a brush and a moist cloth. The glass was washed in water with detergent; accretions were removed with a razor blade. The photograph was cleaned with a dry brush, but extremely dirty backings without any information on them were discarded. The frame and the glass were labeled with the inventory number of the print. One exemplary photograph was reframed for the benefit of the staff members. The photograph was placed behind the clean glass, a new backing made from thick Sa-paper and a greyboard from Thailand. The backing was fastened with nails. Finally, the back edges were sealed with a gummed paper tape that we imported from Vientiane, the capital of Laos, to keep dirt and insects from entering the frame.

Since the shallow frames used in the monastery collections do not allow for the use of spacers, the photograph was reframed in direct contact with the glass. This is very problematic in that it is quite probable that the image will stick to the glass when it becomes too hu-

mid. Every effort is made in the archive to avoid returning framed photographs to the original monasteries, since the chances of their becoming damaged or lost is great. As an alternative, copies of the prints will be made with a donated inkjet printer during the second EAP project. These will be placed in the original frames and returned, so that the originals can be preserved in the archive.

- Workflow

Tackling a project as large as sorting, cleaning, digitizing, and preserving over 15,000 photographs is quite complex. It was therefore necessary to introduce a simple but efficient workflow that would be rigid but allow a certain degree of flexibility at the same time. We decided upon a permanent order for the scanner and the computers on the table, and boxes were designated for the temporary storage of the photographs as they went through the various processing stages.

## CONCLUSIONS AND OUTLOOK

My involvement as a conservator in the establishment of the Buddhist Archive of Photography went beyond the usual tasks of a conservator in a typical institution: next to preservation, handling, and conservation issues, I was also responsible for implementing cataloguing and digitization workflows and teaching fundamentals of photography. In general, I found that much good can be done with very little financial back up, and that working on a shoestring can enhance creativity in problem-solving. Especially in a – for us – foreign setting, making compromises and listening to differing opinions is fundamental in bringing a project to success. Working within a monastery environment also helped open my eyes to the varying significance that photographs can have in different cultures.

Language proved to pose many interesting challenges, since the Buddhist Archive of Photography is of a bilingual, if not multilingual nature. Annotations and inscriptions on the photographs, for example, were found in Lao, Pali (Tham script), French, Khmer, and Thai. Some of the former monks working in the archive had studied in Thailand and were also fluent in reading Pali, and French is common as Laos is a former colony of France. The various scripts make cataloguing the information on the objects quite tricky, however. The language barrier between the Lao and the western staff was also challenging. It soon became clear to me that there was no equivalent Lao vocabulary for a number of terms related to photographic processes and technology that I had been using freely during my stay and, as it turned out, much of what I had been talking about had remained a mystery to the staff. To resolve this situation, we worked together on creating an English–Lao glossary of technical terms relating to photography and archiving. This glossary helped us through the difficulties of communication and proved to be a wonderful source of amusement, understanding, and cultural exchange on both sides.

By means of the implementation of the Buddhist Archive of Photography and due to the mere fact that the prints are being collected and taken care of, the photographs of the monasteries of Luang Prabang have experienced an increase in significance within the monks' community. Their survival over the next decades has become more probable, since they are now less likely to become moldy, dirty, physically damaged, eaten by insects, stolen, or simply lost. A number of questions related to the conservation of the photographs that are in especially poor condition have not yet been properly addressed, however. During my visits to the archive, we decided to simply stabilize the condition of problematic objects as best as we could for the present and plan further trips to Luang Prabang during which urgent conservation treatments would be carried out.

Until then, prints with serious problems receive a special entry in the Excel lists that will enable us to identify them later for treatment. Despite basic stabilization, the long-term preservation of these specific photographs is endangered. The following cases are examples of the dangers and the proposed treatments that cannot be carried out without advanced conservation experience or training:

- Stabilization of physically damaged photographs  
Photographs that have suffered losses through insect infestation, mould, or water damage are currently not fit for handling by researchers. They should be stabilized by lining to Japanese paper or mounting to a rigid support; tears and holes should be mended on a basic level.
- Treatment of photographs damaged by water and mold  
Water is the main source of degradation of the photographs in Luang Prabang. It causes the emulsions to disintegrate, adhere to glass and plastic enclosures, and it encourages mold growth. The affected emulsions are acutely endangered: they need to be disinfected and consolidated if they are to survive the next years.
- Removal of photographs from glass  
This is the main problem with the framed photographs in the collections. Without removal from the glass, these photographs cannot be properly digitized or easily handled. In addition, it will be difficult to deter the adhesion of larger areas of the prints to the glass in a tropical climate. Realistically viewed, prints with large stuck areas may never be able to be removed from the glass, so digitization of the images through the glass, which is often dirty, and storage of the glass with the attached prints may be the only steps we can take at this moment.
- Removal of photographs from albums where necessary  
Some of the albums have served to protect the images inside them; this is the case for the paper albums, for example. Others, however, such as the PVC sleeve albums, have caused further deterioration of the photographs due to their inappropriate materials. This is also the case for some of the sticky albums. Photographs in these albums should be removed from the pages, since their long-term preservation cannot otherwise be assured.
- Solution for digitization and storage of the negatives  
The majority of the silver gelatin negatives encountered were on a cellulose nitrate base. This material is known to be unstable and inflammable. Although self-combustion is not to be expected with the small amounts present in the archive, the nitrate and acetate negatives will surely deteriorate at an accelerated speed in Laos' warm climate. Following their digitization, which to date has not been possible due to lack of equipment, these unique photographic materials should benefit from a separate storage solution.

The overall improvement of the storage conditions of the photographs in the collections of the Buddhist Archive of Photography has been great. The prints and negatives are being digitized and put into an order appropriate to their significance. These first steps will not persevere in the long term, however, if there is no improvement in the external conditions. A photograph that has been cleaned of mold can suffer from a new fungal outbreak as soon as the atmospheric conditions are suitable for this, e.g. warm and moist, which is often the case in a tropical climate. Problems of mold and insect damage can only be controlled by a stable, cool and dry climate. This will most likely only be possible by the implementation of climate control equipment. This

step, on the other hand, is only feasible if the storage vault is an interior, closed room either without windows or at least with glazed windows. Therefore, for the preservation of the valuable photographs of the Buddhist Archive of Photography, the involvement of a conservation expert on a long-term basis, the evaluation of the feasibility of long-term climate control, and the implementation of conservation measures for the damaged photographs will need to be considered.

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