HAND PAPERMAKING IN THE 21\textsuperscript{ST} CENTURY: TRADITION & ENVIRONMENTAL INNOVATION

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Art and the Book

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WE HEREBY RECOMMEND THAT THE THESIS PREPARED UNDER OUR SUPERVISION BY PATRICIA S. HARDEN ENTITLED: HAND PAPERMAKING IN THE 21ST CENTURY: TRADITION & ENVIRONMENTAL INNOVATION, BE ACCEPTED AS FULFILLING, IN PART, REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN ART AND THE BOOK.

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THESIS STATEMENT

This thesis explores the art of hand papermaking in the United States and most of Southeast Asia, where hand papermaking has been a tradition for many centuries. By examining how resources and methods may have been changed due to the environmental movement and concerns, this thesis demonstrates that hand papermakers have continued to exercise caution and respect for the environment through their hand papermaking practices.
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INTRODUCTION

“Whenever people engage their hands and minds to make paper, there is a continuing opportunity for evolution of the craft.” (Heller, 1978)

It has been said that Chi Lun of China invented the craft of handmade paper in the year 105 A.D. Every country, religion, and sect lays claim to being the one to bring the knowledge of papermaking into the world. The truth of the matter is that many craftspeople have been involved with the technology of hand papermaking for many centuries. Our ancient civilizations had numerous ways of changing cellulosic materials into writing surfaces.

Historians have stated that traditional papermaking was, and still is, practiced by families or villages in many countries. These villages were usually situated near a source of water for the village to sustain them, but also because water is an essential ingredient needed to make paper. They say that the Chinese unlocked the understanding of hydrogen bonding, which is the chemical property that holds paper together, and which could be defined by a mass of water and beaten fibers that are washed over a screen of finely woven mesh. Another important step in the process is the removing of water from the recently made sheets and also the drying process. The water must be removed so that the sheet of wet pulp becomes a usable sheet of paper. The other and most important ingredient in the formation of paper is the material that is chosen for the paper itself. There are many fibers to choose from. In the beginning of papermaking, papyrus was used to make most of the paper. This plant grows along the riverbank in Egypt and
Africa. Due to the labor-intensive process to make paper from this plant, including weaving the layers together to form sheets, other suitable materials were searched out. Traditionally papermakers utilized renewable resources such as wood, bark, and many cellulose fibers. In time, our societies have had to adjust the processes and find a way to avoid pollution and work to help the environment while creating paper. Papermaking has also become a popular way for some creative people to participate in recycling at a local level.

There can be several labels assigned to a papermaker, such as an artist, craftsman or craftsman. Even before the Internet became the go to place for answers to all of our questions on how to do anything, papermaking helped start the new era of openness. Recently there have been many how-to books emerging on the scene that not only reflect an interest in handicrafts, but also an interest in engaging children and adults in the arts and crafts movement. Papermaking takes considerable time and effort to produce a sheet of paper that is uniform in size, shape and maybe color, depending on the final use of the sheet. There is a line that can be drawn between art and craft. Crafters may say that they make handmade paper. They may say that they produce many sheets of paper to make cards, invitations, paper for decorating and also writing. In doing so, they may even label themselves an artist. These so called crafters are typically producing this paper in their kitchen using a household blender. The materials they are using are probably junk mail or paper products from their own recycling bin. The mould and deckle they are using may be a splatter screen from their pots and pans cabinet, so that they may strain the water from the pulp that has been chopped, pureed and liquefied in their kitchen blender. The finished sheets, which are pasted to the kitchen table to dry or maybe hung on a line,
will be something to cause great joy to this so-called papermaker. Can this person be labeled papermaker? Some people do make handmade paper from recycled paper in their kitchen, and they can still claim to be a hand papermaker.

There is a distinction between art and craft. There is also a line between paper art and handmade paper. For the traditional papermaker, they do not usually see themselves as an artist. They usually work to achieve uniformity and consistency. In the hands of the artist, a large amount of creativity goes into the production of paper art and objects and the modification of handmade paper for their artwork.

The fine line can start to veer off when the papermaker begins to specify what the paper will be used for. At this point there are many questions the papermaker asks before beginning the rigorous process of making handmade paper. One of the first questions would be to address what the paper will be used for and what fibers would be best to achieve this goal. If the paper is going to be used for printmaking, you will need to have a very smooth surface and rather thin for a press, and this paper will need to allow ink to bleed into the fibers. There are many options as far as fiber is concerned. One may want to choose something from a papermaking supplier that is ready to beat or have the choice of gathering one’s own materials from nature for the end result. Another important aspect would be to know what size the paper needs to be. The need for color is a factor to consider and whether you will use natural dyes or synthetic dyes. There are so many uses for the paper, a book, a painting, a poster or maybe a sculpture. The end result is the final destination on how to base the paper.\textsuperscript{iv}
CHAPTER TWO
ASIAN PAPERMAKING

Asia is known for its time-honored traditions of papermaking. The beginning of the Industrial age brought many changes to the paper making societies, which for many were families that supported themselves and their communities. Time honored secrets and recipes began to change into a common market product. The digital age helped many papermakers to turn back to their roots of their cultural traditions.

Dard Hunter, a paper historian, traveled extensively in Asia and the Americas researching and learning about different and varied hand-papermaking techniques. His journeys comprised searching for tools, stories and photos. Others have followed his path to learn the traditions and practices of different papermakers and about their materials and production practices.

The most important aspect of papermaking deals with a fresh water source. Village papermakers didn’t use chemical bleaching that happens in modern day papermaking. The pulp would either be left out in the sun or snow or in running water for days at a time to achieve the desired bleaching process.

CHINA

An article dated April 1997 claimed that China was the largest supplier of handmade paper products. Many countries that have had long-standing papermaking traditions have seen many changes due to innovations in machinery such as foot-operated beaters and
presses that are wind-operated that take advantage of natural power.

One village where an ancient tradition lives on is Shiqiao Village, located in the mountainous area of southwest Guizhou Province. Inside a typical cave of approximately 400 square meters workshops are being held to teach the ancient art of papermaking. The ShiqiaoQianshan Ancient Papermaking Society (SQAPC) holds these workshops. One of the reasons for choosing to offer these workshops is the spring water, which runs through the cave. The water is rich, high-quality, and unpolluted, and the best for papermaking.

In 1998 the village became a popular tourist destination for those with an interest in the traditional artistic paper making processes. Due to the revitalization of the papermaking business and activity, there were many new developments in the area of new products, causing major progress and financial success for the village. The paper being produced in the village is of such high-quality it is sought after by artists and used for the restoration of ancient books. This whole process from the raw materials used and the pollution-free water is what makes this paper such a high-quality product. In fact, the crops receive irrigation benefits from the wastewater of this papermaking.

In 2011, there were sixty-one families that were employed by the SQAPC, processing approximately 100,000 sheets of paper. But due to the lack of funds to buy drying equipment, they must rely on the sunshine to dry the sheets. The weather has an impact on the workday for the papermakers. If it is a rainy day, the work will be shut down until the rain is over. At the present time, the SQAPC has several apprentices in hopes that
these men will carry on the ancient traditions of Shiqiuo.

PAPERMAKING IN THE PHILIPPINES

Rice, native to Africa and countries in Southeast Asia, including the Philippines, India, China, Korea and Japan, is a vital food source for the world and feeds billions of people. Though there is no record of the beginning of papermaking in the Philippines, it is believed to have developed some time during the Hispanic period in the early 1500’s. The Spanish brought rice over to South America, probably at the beginning of the 18th century.

After the rice is harvested, billions of tons of rice straw, which is the waste from the plant, is thrown away or burned. This rice straw can be used to make paper. This fiber is an alternative to wood that has helped prevent deforestation. Rice grows well in Southeast Asia and Africa, but can grow anywhere with a minimal temperature of 75 degrees. The plant requires a lot of rainfall due to the fact that it is grown in shallow water and has exceptional water resistance.

In the Philippines, it can grow in either the wet or dry season, but produces a higher yield in the dry season. It takes three months to grow a rice plant from seed to harvest. Due to this fact, farmers are able to have three crops in one year. One of the environmental factors affecting rice is the temperature. The rice can grow in warmer climates as long as it is not too warm. Researchers have expressed a concern about global warming and an increase in temperature, which could drastically reduce the rice yield.
Nature has its own pests that can affect the rice such as insects, birds, weeds and rodents, which are common, but are also magnified by the overuse of pesticides, fertilizers, and the weather.

In the late 1970s a research project began based on the indigenous materials found in the Philippines. Several government agencies pooled their knowledge and resources to encourage papermaking using rice straw. One agency, the Forest Products Research and Development Institute (FPRDI) confirmed that the rice straw was suitable for making paper that could be used for high-quality paper for special purposes, such as art paper, greeting cards, and novelty paper items.

National Tobacco Administration (NTA) disclosed that tobacco stalks usually thrown away could be processed into high quality paper. The pulp yield from tobacco, which is about 65%, is higher than the yield of rice straw, Dogon grass, banana, and pineapple fiber, and comparable with abaca fiber, the most commonly used fiber for handmade papermaking. The rice stalks are termed bast fibers, which is the fibrous inner bark that is located between the outer surface bark and the inner core of a tree or shrub. Fibers such as abaca, salago, cogon and raffia made the Philippine paper unique for novelty papers. However, due to the high cost of the abaca pulp, chemicals and the machines required to process the fibers, the industry became crippled and needed to find alternative fibers to make paper. vi

Up until the early 1970s most handmade papers were made for export. Through the action of the Product Development and Design Center of the Philippines (PDDCP), the handmade paper industry growing and thriving. There was potential for the handmade paper market to develop from a small backyard operation into a thriving income
producing business blossoming in the 1990s. Several government agencies were looking for alternative materials from the rice straw that were cheaper and involved the use of indigenous art materials.\textsuperscript{vii}

In 1995, there were two handmade paper organizations that had formed to promote the handmade paper industry. These groups had promising potential in the papermaking world in the Philippines, but the domestic market was very slow and there was a lack of proper marketing, which had an effect on the Philippine handmade paper industry, leaving it struggling and stagnant.

In 1999, Loreto D. Apilado started working for the Cottage and Industry Technology Center (CITC) to help promote the handmade paper industry. Mr. Apilado started a small pilot garden to try to promote new and local fiber plants. His goal was to find alternative, good quality fibers for hand papermaking. Abaca fibers, also known as “manilla hemp” is one of the strongest material fibers in the world. Due to the use of abaca in other industrial applications, the demand for the pulp and fiber is overwhelming. Although there are over three hundred different varieties of fibers available in the Philippines, including the aforementioned fibers such as cogon, rice straw, pineapple, etc. most of these fibers are not available in commercial quantities and are not stable fibers alone without the addition of the abaca fibers.

As of April 2013, Mr. Apilado is still working in the Philippines to promote the art and craft of hand papermaking. He stated in a recent email that he is still an advocate of green or environmentally friendly papermaking. There are few remaining commercial hand papermills in the Philippines. One is the Hardin ng Kalikasan Women's multi-purpose Cooperative. The other hand paper mills are Salay Handmade Paper
Industries and Cagayan de Oro Handmade Paper Crafts. Mr. Apilado quoted that he had consulted with them in the past and the most successful one is Salay. The others are GSG Industries and TADECO. GSG is located in the Bicol Region while Salay, Cagayan de Oro and TADECO are operating in Mindanao. The best example of an ideal livelihood and successful hand papermaking business is Salay or SHAPII, which seems to have a strong social and environmental development program.

Hand papermaking in the Philippines has been a source of livelihood but gradually has declined since its peak in the early 1990s. Duntog Foundation is a non-profit foundation for research and education in the use of native Philippines fibers for handmade paper under Mike Parsons, who actively promoted the arts and crafts of hand papermaking in the Philippines.

Before the First Philippine Handmade Paper Conference in 1991 in Baguio City, most hand papermakers had limited knowledge of environmental issues or environmental concern. They used a strong alkali and synthetic coloring for their hand papermaking without any regard for the effects of their work on the environment. “They just dug a pit right beside their cooking area, but worst of all, they just threw their effluent on vacant lots, and horror of all horrors, you could see earthworms surfacing from down under gasping for any air”.

Mr. Apilado also stated “there are no artists in our country that earn a living using paper as a medium for their art. Our country is more traditional in the use of the medium,
which is mostly oil or acrylic on canvas. Paper, and not even handmade paper, is mostly used as a support as in drawings, prints, and watercolors and sometimes in acrylic. In one of my mentorships to a group of women in the Philippines, I introduced a new sustainable and renewable fiber source and natural dyes for their hand papermaking and the proper way of using chemicals and its proper disposal.

(See Fig. 1)

From July 13 through November 6, 2010, an exhibit at the Yuchengco Museum in Makati City, Metro Manila, Philippines featured an exhibit called “Pumapapel: Art in Paper” that featured seven artists, artisans and designers who use paper on which their art is expressed. One of the artists featured was Asao Shimura, a Japanese book artist, papermaker and also an internationally renowned expert on handmade paper who has been living in Benguet since 1989 after having moved there to learn more about using pineapple fiber for papermaking. Mr. Shimura serves as a manager and consultant for papermaking projects in the Philippines.

In 2008, Shimura created a traditional papermaking village in Ifugao, where the residents of the village create handmade paper and other artwork that combines Japanese methods and the raw materials that are available in the Philippines. (See Fig. 2)
INDIA

Papermaking has a tradition in almost every country, and India is no exception. India has a tradition of papermaking that deals mostly with paper made from recycled materials, such as waste textiles that include fishing nets, rope, jute flax, and other vegetable fibers. Due to the complex nature of these fibers, longer beating times were needed to break down these fibers. It usually required the materials to be soaked for many days and sometimes weeks. In order to alleviate and reduce the time for this process, certain chemicals were needed to break down the fibers in a shorter period of time. This process was called “retting”. The chemicals involved are Potassium Hydroxide (lye), and Calcium Oxide lime (CaO), first known as roasted lime, which are both inorganic compounds. During retting and with the addition of the chemicals, the fibers ferment and go through the process of hydrolysis, generating extreme heat.

Mahatma Gandhi was a leader who believed in a non-violent society and the principle of 'swadeshi', which means having local self-sufficiency in the villages and supporting local craft traditions such as papermaking. Krishna Joshi, Gandhi’s papermaking assistant, was instrumental in introducing various innovations that have led India to become one of the most important sources for handmade, mould-made papers in the recent era. The papermaking communities focused on using technologies available at the village or household scale.
The Kumarappa National Handmade Paper Institute, an autonomous body under the KVIC-Ministry of Micro, Small and Medium Enterprises of the Government of India, has been instrumental in promoting the growth of the handmade paper industry. Located in Sanganer, Jaipur, India, the area consists of a 3-acre piece of land in a village environment that is free from the everyday pollution prevalent in India. The institute has been working for the improvement of the handmade paper industry through activities, such as research and development. This research and development work is based on finding various alternatives to raw materials that are abundantly available and the utilization of these materials on a large-scale basis in different areas of the country.

In a recent email from Jenny Pinto, a local artist living in India, she states that handmade papermaking is quite spread out in pockets all over the country and is mostly commercial. She also states that there is practically no family-run papermaking any longer. Ms. Pinto remarked that she is only one of very few artists making paper in India. She also stated that there are foreigners in Pondicherry, near Chennai, making paper, but their practice is different from traditional Indian papermaking.

Ms. Pinto also commented that the only other people she knows are all commercial papermakers that run little factories. She also stated that there are very few traditional papermakers, called Kagzis, remaining now. In a final comment she stated that if there were any hand papermakers left, they would be in Santander, Jaipur, but Ms. Pinto has her own papermaking business in Bangalore, India where she makes paper the old
fashioned way. She makes a unique range of beautiful, translucent and textured paper from agricultural and craft waste fibers like banana, sisal, mulberry, various rivers grasses, pineapple and more, and designs a range of lights, home accessories and stationery using her own paper. Ms. Pinto is very active in helping non-government women's organizations with design and technical inputs, to set up small rural groups of women entrepreneurs who are active in making handmade paper products.

NEPAL

Nepal has very plentiful natural and human resources, which has made the country rich with traditions that have been passed down for many generations of family. The flora and fauna provide materials for creating beautiful clothing, and other household items such as lamp shades and bags. In the hillsides of the country, the indigenous communities have long harvested the bark of the lokta shrub to make their handmade paper. These shrubs grow abundantly at the lowest level of the forest on the slopes of the Himalayan Mountains. These plants and other forest flora have given the flourishing crafts industry precious materials to help the country’s craftspeople continue with their traditions and economic growth.

The bark from these scrubs is made into pulp, which is then spread and dried. These sheets are then prepared for the Nepalese government for documents such as birth and land certificates. This tradition has been practiced since the 12th century.
The Himalayan Bio-Trade Private Limited, which began in 2000, is an organization, which has helped to process and market the “forest-derived” products made by these members of the Nepalese communities. This community-owned organization has helped raise the skill level of these craftspeople and improved their standards of production and product quality. The organization has introduced these crafts into the regional and international markets and has raised their economic well-being and helped to ensure the fragile environment upon which the Nepalese people depend on for their livelihood.

In 1980, The Handmade Paper Project (HPP) was launched to help revive the country’s handmade paper industry. A pilot program was begun to research the sustainability of lotka harvesting methods. The HPP’s focused on the small-scale rural enterprises and were manufacturing NTFP’s (non-timber forest products). A non-governmental organization called the Asia Network for Sustainable Agriculture and Bio resources (ANSAB) began.
CHAPTER THREE

HISTORY OF AMERICAN PAPERMAKING

A fiber that has been pushed aside and rarely used in the papermaking world these days is hemp. Hemp has been around for over a thousand years in Asia and Europe. It is thought to have been the earliest material used in Chinese papermaking. The Gutenberg Bibles were printed on hemp paper and also the Declaration of Independence. Hemp paper at that time consisted of reprocessed hemp canvas from sailcloth. Thomas Jefferson and George Washington both grew industrial hemp and tried to encourage farmers to grow hemp instead of tobacco.

Up until the late 1800s, seventy-five percent to ninety percent of all paper was made from hemp. The Department of Agriculture published a bulletin in 1916 called the "USDA BULLETIN 404 - Hemp Hurds as a Paper Making Material", concerning the industrial use of hemp which encouraged hemp for paper production as an alternative to wood pulp. The major emphasis of the document was to state the value of paper made from hemp hurds, the crop waste from the hemp fiber plant. The document was based on comparing the value of utilizing the hemp hurds for paper production as an alternative to the use of wood pulp, which began in the early nineteenth century. The use of wood for paper pulp was very unstable alone and did not produce strong or durable paper that could withstand time. The logging of forests began to feel the effects of the production and consumption of wood for pulp, thus it became very costly and drove up the price of wood. Due to the price increases in wood, paper mills began to turn to alternative fiber materials, such as hemp.
In 1996, an article was published from the “Ecological Agriculture Projects”, a publication from the faculty of Agriculture and Environmental Sciences of McGill University, Quebec, Canada, stating the environmental benefits of hemp. The article claims many environmental benefits to using hemp over wood pulp for paper production such as “an acre of hemp will produce as much pulp for paper as 4.1 acres of trees over a twenty year period”\textsuperscript{xv}. Another advantage of making hemp paper is that is requires no dioxin producing chlorine bleach and uses at least seventy five percent less sulphur-based acids.\textsuperscript{xvi}

Even though there are major advantages to growing hemp for paper and other items such as textiles, plastics, fuel and lumber, the ban on growing the plant was implemented by the Drug Enforcement Agency (DEA).\textsuperscript{xvii} Another name for hemp is cannabis sativa, or the common name of “pot, marijuana, weed, etc.” and a drug that is not illegal in the U.S., but due to the fact that hemp contains tetrahydrocannabinol (THC) which is a psychoactive chemical the crop has never been able to be grown in the United States. All hemp products are imported from other countries such as India and China that grow industrial hemp as a fiber crop. Many groups and organizations have and still are fighting to raise the ban on growing industrial hemp in the United States.\textsuperscript{xviii}
CHAPTER FOUR
CONTEMPORARY PRACTICES

Scientists have been observing a change in climate ever since the beginning of the 20th century. This change in climate has not been solely attributed to natural factors of the past. Human induced factors are given the term anthropogenic as these industrial activities have irreversibly changed the planet. Papermaking is sensitive to the changes in the environment.

Due to this altered environment, the methods of papermaking and art making have had to explore alternative methods to adapt to these changes. Global warming carries a huge connotation as to where and how our world is being affected. Greenhouse gas, commonly known as GHG, is caused by water vapor in our atmosphere. Even though water spends such a short time in the atmosphere, humans have had the biggest impact on this very important factor for papermakers.

How can papermakers have a sustainable papermaking practice in regions lacking access to fresh water? One alternative to using fresh water is to turn to seawater papermaking. This alternative method of papermaking is not for the traditional artist that is looking for consistent papermaking results, or is concerned with the fact that the paper will not be archival. The pH of archival acid free paper is 7, which is pH neutral, compared to seawater, which is pH 8.2, or slightly alkaline. Comparing the pH alone, seawater is a good substitute for archival papermaking and also offers an answer to the
depletion of fresh water sources.

Maggie Puckett is an American artist who is using seawater for her artist’s books. Her book entitled “Salty: Lick This Book”, features handmade papers from cotton, abaca, sea salt, table salt, and pigment. She also throws in thread, squid tentacles and polyvinyl acetate known as PVA, a common adhesive for artists working in paper and book arts. One of the considerations of using seawater is its physical composition and that seawater contains different elements, organisms, and pollutants. Its makeup changes due to its proximity to continents and ice. Using seawater for papermaking can be a good vehicle for raising awareness of the changes that are happening in our oceans. Hopefully this awareness prompts an increase effort of protecting the oceans. The artists that will be attracted to this method will be the environmentalists, adventurists, and those willing to be surprised by interesting results.\textsuperscript{xix} (See Fig. 3)

\textbf{GREEN STUDIOS}

Another excellent example of an artist focused on protecting the environment is GibbyWaitzkin, a hand papermaker living and working in Floyd, Virginia. She has given new meaning to the terms sustainability and recycling with her modern environmentally friendly studio, Sarvisberry. Several years ago, Ms. Waitzkin realized that she needed more studio space that would incorporate efficiency and a more environmentally sound studio for her papermaking. She states, “papermaking has become an extension of my life to raise environmental awareness.” Ms. Waitzkin harvests different plants that she
finds on her walks in the neighborhood. There are a variety of plants within a few minutes walk, such as iris, cattail, thistle, bamboo, lavender, and Catawba tree pods. She processes these according to the type of plants and uses an alkaline mixture to make an acid-free and chlorine-ree pulp.

Graeme Waitzkin, her son, is a product designer and engineer who helped her in the designing of the Sarvisberry that reflects her values of repurposing raw, local materials that have been salvaged to create something new. The studio was built in the side of a hill to utilize the existing landscape to provide insulation and grade level access to both levels of a two-story building. By orientating the building south facing, it incorporates a passive solar effect that reduces the heating costs and gives a maximum amount of light. When the site was excavated, trees were cut down, but then they became the lumber used in building the studio. An amphitheater-style garden space was created after a meeting with a solar feasibility analyst. This design allows for maximum sun exposure for future solar panels.

Even the rainwater is collected from the roof into two large underground cisterns for use in the process of papermaking. Due to the amount of soil erosion from the construction, they planted quick growing varieties of groundcover and tall grasses to prevent washout and soil loss. Not only do they provide protection from washout, these plants are a source of fibers for the papermaking. (See Fig. 4)

A recycled concrete board and corrugated metal siding cover the outside of the building. The building is cloaked with a green screen, giving creeping plants, such as
wisteria, honeysuckle, and trumpet vine a place to grow. This screen also gives great insulation in the summer as well as an environment for birds and butterflies. The two-story building was designed as a 30 x 60 foot grid giving them an area for a computer design space, away from the wet studio and a huge area for the wet papermaking. There is a living area in the upstairs portion of the building. The floor of the papermaking studio contains in-floor drains so that the water from the papermaking activities could be directed into the garden. The insulation in the building consists of recycled paper and sprayed soy, which was blown into the walls. There was much planning into the design, construction and materials that went in this green studio. Ms. Waitzkin’s main idea was to “compliment the land, minimize impact, and inspire visiting artists to come for a visit”.xx

**TREE FRIENDLY**

Jeff Lindenthal and his wife Melissa Smedley started a small part-time business making note cards out of recycled junk mail. In 1997, they changed the name to Greenfield Paper Company, which makes its paper products both by hand and by machine. The company focuses on tree-free fiber papermaking. The products they sell are usually infused with seeds from flowers, herbs or vegetables that can be planted once the user is finished with the paper. Some of the fibers they use, other than recycled paper products, are hemp fabric to make hemp thread paper. They also make a product called Gilroy Garlic paper, which has inclusions of garlic skins from the chaff of garlic bulbs from a nearby crop. The company produces journals, stationery, sketchbooks, and cards.
In 2001, Greenfield shifted its focus to making more machine-made paper to scale up the volume and reduce product cost. Also in 2001, Greenfield started manufacturing a line of recycled papers made with non-wood fibers such as hemp and organically grown cotton in collaboration with a 100 year old paper mill in Turners Falls, Massachusetts. The mill was one of only a handful of remaining paper mills that used rags in the United States pulping textile fiber. The mill used primarily cotton textile waste as a feedstock for its papers. In February 2001, the mill started producing machine-made paper made from a blend of hemp textile cuttings and postconsumer office paper, which the mill purchased from other mills in the United States producing pulp from office paper. The paper was also bleached with hydrogen peroxide instead of chlorine bleach. Lindenthal states that textile mills and paper mills are located in close proximity to each other so that the waste from the textile mills, which is mostly cotton, is taken to the paper mills and turned into paper. Any leftover trim materials from clothing companies that use organic cotton are used as feedstock.

Now in 2013, the company has made a commitment to offset 100% of their companywide electricity use by purchasing wind credits for their electrical usage in their manufacturing and office facilities. They are able to offset their total electricity usage by partnering with a number of wind farms across the country through a system of renewable energy credits that brings together suppliers and buyers of wind. xxii
Bridget O'Malley and Amanda Degener

“There is a certain rough elegance to the papers which is difficult to explain in words. It begins and ends with the raw materials.” Bridget O’Malley

Cave Paper is a production hand-made paper mill located in Minneapolis, Minnesota, that began in 1994 by two women, Bridget O’Malley and Amanda Degener. The mill is dedicated to making decorated paper and unusual sheets of high quality paper for use by artists. The fibers they use are flax, cotton, rags, and denim. The dyes and pigments are natural from black walnut stain and iron oxide.

The handmade paper they are making is inherently eco-minded. They are interested in both the archival results of the paper, and making it with as small a footprint on the planet as possible. They state that luckily, those two goals are not in conflict with each other. It seems the techniques used hundreds of years ago made the best paper; so they try to follow the “less is more” approach when using any chemicals.

The studio space also dictates some of their choices. For example, they don’t have kitchen-grade ventilation, so they don’t cook with or use chemicals that off-gas into their space. On March 25, 2013, Ms. O’Malley states via email that they “have to breathe in here too.” They have rigged up a few options for cooking outdoors, or in other spaces that do have better ventilation and then hauling stuff back to the cave. They haven't really changed how they operate over the years to be more environmentally friendly, because they feel that they are “pretty good there already.” One change is sourcing the
fiber more locally to reduce their carbon footprint. For water use reduction, they would like to investigate options for grey water use or other repurposing of waste water instead of always using fresh water from the hose.

FOUND MATERIALS

Many papermakers prefer to make paper from flowers, plants and other natural fibers found in their local areas. This kind of paper makes for very interesting textures due to the materials chosen for the pulp. Many exciting textures and natural colors can be achieved by experimenting with the different plants. Although plants and weeds make for unusual and varied textured paper, using these plants as the sole fiber is usually unstable. The addition of cotton fiber, such as rags or abaca fiber, gives the paper more strength and durability.

Helen Hiebert is a nationally recognized artist, papermaker, teacher and author who has written numerous books on papermaking including, “Papermaking with Garden Plants and Common Weeds.” In her book, she discusses the fact that when papermakers are collecting plants, they should be aware of the kind of plants they are collecting and if they might be disturbing a natural ecosystem, or if they might create erosion problems by removing plants from a certain area. Ms. Hiebert also states that they also may not be aware of the fact that you may be interrupting the life cycles of insects or animals.

Ms. Hiebert commented on her practice of papermaking that “hand papermaking is automatically green. One of the reasons I became fascinated with it was due to the life cycle of the process: you can grow a plant, make it into paper and then recycle it. I wasn't
necessarily attracted to it because it is environmentally friendly, but I'm happy it is! The only chemicals I use are sizing and pigments, and for the most part those are retained in the pulp (and resulting paper) so they are not going into the waste stream.”

India Flint, an artist and teacher living in Queensland, Australia has written a book, “Eco Colour, Botanical dyes for Beautiful Textiles.” Ms. Flint has a term she often uses called “windfall” where she recommends when collecting plants and materials, that one should always pick from the ground and not harming any plants or trees for your artistic purposes. xxiii

There are many active hand papermakers working at their art in this country and abroad. The Friends of Dard Hunter: American Contemporary Hand Papermakers is one such organization that honors the life and work of Dard Hunter with annual conferences and exhibitions. Outside the United States, the International Association of Hand Papermakers and Paper Artists, also known as IAPMA, states their main objective is to facilitate and encourage the international exchange of ideas and information about hand papermaking, paper and paper artists. Every year the organizations hold conferences to help promote, support and encourage the exchange of ideas and uses of hand papermaking for today’s environmentally conscious art audience.
CHAPTER FIVE

CONCLUSION

The focus of this paper has been to explain how tradition and innovation has affected handmade papermaking due to environmental concerns in the twenty-first century.

In our modern world, life revolves around time. This may be the reason why over history papermakers have changed their traditional ways of processing paper to include chemicals for process fibers for beating. The method of pounding, soaking, retting, and letting the fibers sit for days or maybe weeks, forced papermakers to find an alternative to speed up these lengthy processes. This involved chemicals or substances that were unnatural or caustic to the planet but, since time is equated to money for many individuals, papermaking companies looked the other way when disposing of these byproducts unaware of the long-term environmental consequences.

When environmentalist became aware of the threats that these caustic byproducts were doing to the environment, papermaking came full circle back to the traditional ways and many non-caustic sources were found and some rediscovered. Many of the hand papermakers of today have seen the need to preserve the art of papermaking by honoring the environment and the planet. They are choosing alternative methods of harvesting, using different and better chemicals to process and utilizing resources that may have never been realized before.

Cathleen Baker, author of a recent book on hand papermaking states that “the basic
technology of papermaking, whether by hand or by machine, continues essentially unchanged”.

Throughout the research on past and present hand papermaking in the world, two facts became evident to the writer. The first is that papermaking in the United States exists mainly as a source of pleasure whether as art or small businesses at home where most hand papermakers do not rely on the financial gains or financial sales to sustain them. The second was that hand papermaking in other countries, particularly in Asia, did rely on papermaking as a major source of income for individuals as well as families and villages. Most of the papermakers in the United States stated that they followed the traditional methods of hand papermaking in an effort for environment sustainability. There are still many small businesses in some countries trying to preserve the art by teaching others to carry on the traditions of the past.

Paper has been around since the beginning of human activity and has been used in every capacity imaginable. The industrial revolution has undercut the high costs of handmade paper. Human skill is no longer a commodity item in the world of paper. In some societies, unfortunately, commercialization has overridden the need for the hand papermaking traditions almost to the point of extinction, but the art and science of papermaking worldwide continues to persevere.
LIST OF FIGURES AND ILLUSTRATIONS

Fig. 1. Two Apprentices boiling paper mulberry (kozo) using lye solution and students in front of their stripped and cleaned kozo bark, hung on a clothesline for drying.

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Fig. 2. “Easing In” from Asao Shimura, Philippines, 2012  Kozo paper with shifu.

Fig. 3. Maggie Pucket Formed sheets of seawater paper laid in the sand
Fig. 4. *Installation of rainwater-collecting cisterns.* 2008. Sarvisberry.
NOTES


2 Ibid. p.1737.


11 Email dated March 25, Jenny Pinto.


14ibid.

15http://www.levellers.org/cohip/PAGES/IND_HEMP/IHJULY.HTM


18 ibid. pgs. 30-33.


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