PAPERMAKING:
ART, HISTORY AND PROCESS

Submitted

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Concentration Paper

In partial fulfillment of the requirements

for the Degree of Master of Fine Arts

Colorado State University

Fort Collins, Colorado

Spring 1984

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I. THE ORIGINS AND GROWTH OF PAPERMAKING

Was paper a product of necessity, curiosity or happenstance? It is difficult to imagine someone getting up one morning and deciding to cut down some mulberry trees, peel off the outer bark, save strips of the inner bark, boil them, pound and beat them to a pulp, then pour the mixture onto a bamboo screen to drain and dry, thus producing the first paper.[1]

This substance may have originally been intended to be eaten as a back-up food during a time of famine; however, this barely edible material had a habit of sticking together when dry and may have accidentally become the first paper.

Another more historically accepted explanation is the suggestion that paper was "invented" by Ts`ai Lun in 105 A.D. in China. Credit is given to Ts`ai Lun for its invention although he may be only the one who perfected a process that had existed since around 150 B.C. Through his achievements paper became a more readily available substitute for silk (of much higher cost).[2] The original Chinese character for paper includes the symbol of two cocoons on a thread which could mean that silk may have been in paper or that silk was being replaced by the new plant substance for painting and recording.

In addition to silk scrolls, other early surfaces for carrying messages included brick, stone, bark, metal, wax, ivory tablets, palm leaves, tapa, parchment (which was made of skins from sheep, cows, or goats), fish skins, snake skins, the shells of turtles and oysters, and

finally, sheets of linen and cotton.[3] Even with this wide variety of substances for expressing visual ideas, most lacked the portability, versatility and affordability that paper could provide. In order to truly be considered as paper, the materials must be cellulose fibers which, when shredded, bruised, or pounded, combine with water to make a pulp which naturally bond together as they dry due to the conversion of carbohydrates to glucose in water.

The very earliest maker of paper has been around for nearly 300 million years in the form of the wasp. She macerates wood in her mouth and uses the resulting product to build a nest of successive layers of grayish paper (see Figure 1). Few human examples can compare in durability or design to such well made structures.[4]

The earliest known purely paper pulp made by man was a mixture of linen rags, mulberry bark, hemp and fishnets. These first examples were made by the Chinese and their methods spread through Korea to Japan in 619 A.D. with a Buddhist monk named Tamjing. It was in Japan, in 764 A.D., that the Empress Shotoku contributed to the advancement of both papermaking and printmaking with her commission of one million dharani, or prayers, to be printed on paper and sealed in individual wooden pagodas.[5]

Even before the execution of this massive project, the technique of papermaking had already begun its spread westward with the capture of Chinese prisoners by Arab invaders in 751 A.D. With the establishment of two major paper mills in Syria the "secret" spread throughout the Middle East. From there, the Moors were the first to introduce paper to Europe when they invaded Spain in 1151 A.D. Great quantities of paper were produced in Xativa for export to both the West and the East.[6]

Figure 1. A wasp's nest carefully obtained during last summer's vacation.

The establishment of the world's oldest ongoing mill occurred in Fabriano, Italy, in 1276, where handmade paper is still being produced today. From Italy the manufacture of paper eventually spread to every European country. The knowledge then traveled to North America from England, resulting in the construction of our first mill near Germantown, Pennsylvania by William Rittenhouse in 1690. Before the American Revolution paper was being made throughout New England and later it spread south and westward. Just after the Battle of Wounded Knee was fought, Colorado opened its first mill. It was 1891.[7]

Since then the production of paper has become a modern industry, using primarily wood pulp materials. Hand-made paper, created with the skills and quality of European tradition, was virtually abandoned until the mid-1900's when a few artisans began researching and practicing the age-old methods.

Landmark contributions to the hand papermaking field in America have been made by a few pioneering individuals, one of the originals being Dard Hunter. His research and publications concerning papermaking were the subject of his whole life. He influenced and inspired a renaissance of the medium throughout North America. In 1928 he established a small mill in Connecticut where he began making and collecting samples, materials and equipment that eventually came to be housed in the Dard Hunter Museum and Library of Appleton, Wisconsin.[8]

The next master of hand papermaking to contribute greatly to the revival of papermaking traditions was Douglass Morse Howell. An historian of paper, inventor, restorer, designer, philosopher and printmaker, Howell was, in addition, a teacher. It has been his students and their students who have been largely responsible for the

spread of his ideas and techniques throughout the country. Howell explored a new idea of paper as an art object and fought against the standardization of papermaking. He turned away from the "chemical and cooking" approach of the paper industry and practiced only the purest of methods, involving only the fibers themselves and water (see Figure 2). He had a special love of color and once stated that, "there are thousands more colors to be found in nature than the number put into paint...." He also believed that "...the perception of certain colors will evoke certain states of mind. If we are denied these experiences of color or light, our range of consciousness is diminished."[9]

Howell taught his students that vision should be the teacher and one must "observe, observe, observe. For ultimately it is nature which will provide the artist with the necessary truths."[10]

Following the examples of Dard Hunter and Douglass Howell in continuing the handmade paper revival is Laurence Barker. A printmaker by training, he is also a papermaker-artist who taught at the Cranbrook Academy of Art from 1963 to 1970, influencing an entire generation of papermakers. He had many outstanding students who are today leading teachers, mill operators, paper producers and artists. His emphasis was on the importance of the beating process to the quality of the final product. Many distinct papers can be made from the same ingredient by varying the beating times, placement of the roller and the sequence of adding raw materials. It has been these raw materials that have captured Barker's attention and sense of discovery. He believes that papermaking, "ideally begins as an adventure with rags and fibers," for it is at the beginning of the journey that beautiful paper is conceived. The theme of the paper is, "that animating quality, however subtly informed, that bespeaks the paper's origins."[11]

Figure 2. Samples of Douglass Howell's unique paper.

II. TECHNIQUE, SUPPLIES AND VARIOUS METHODS

Traditional Japanese papermaking techniques, as they originated in China, were still being practiced in Japan by over 6,000 papermakers ten years ago, but today there are only about 340 left.12 The remaining artisans carry on a respected tradition, producing remarkably varied papers of enduring strength and quality. The home crafts people, who are the majority of Japanese papermakers, form their paper from the branches of kozo, gampi, or mitsumata trees. The white layer of inner bark is stripped and either dried or washed in a stream if it needs separating from the outer bark. After boiling in an alkaline solution for a few hours, the fibers separate easily and are then rinsed thoroughly. A hand-beating process follows in which the fibers are pounded on a stone slab with hard wooden clubs to retain the length of the fibers so characteristic of Oriental papers. ("Rice paper" is a common yet incorrect term for Oriental paper, as paper cannot be made from rice.)

After the formation of the pulp a substance called "neri" (unique to Eastern methods) is added to the vat of cold water to disperse the fibers and slow down the flow of water through the pulp, allowing the layering of freshly made sheets of paper, one on top of another. Individual sheets are formed on a flexible bamboo screen supported by a frame or mold made of cypress wood. Several layers of fibers are layered together in each sheet by redipping the mold into the vat. When

the desired thickness is reached the new sheet of paper is rolled off of the screen onto a slowing growing pile of wet paper. Later it is weighted or pressed to remove any excess water.

Drying methods vary from one region to the next and depend upon the weather. Sometimes the paper is left on the mold to dry or, if the mold is needed for further production, the paper is drained and brushed onto boards or clean, dry plaster walls where moisture is evaporated by the sun. (See Figure 3.) Sheets of paper are even laid out on hillsides or draped over trees to dry.[13]

In many respects, the papermaking process developed very differently as it found its way to Europe. (See Figure 4.) The two distinct methods resulted from basic differences in materials and the intended uses of the paper itself. Ink and brushes were widely used in the Orient and required a soft, absorbent paper surface. European writing and printing methods needed a firm, moisture resistant surface to achieve quality results. Available sources of materials were quite different in Europe where, "thanks to the fashion of wearing linen underwear instead of that woolen stuff, there were cheap linen rags available to the mills."[14]

Rags and new cloth were collected in the papermills and dampened, rolled into balls and fermented for up to two months. This version of "slow cooking" softened the fibers and began breaking them down. After a thorough rinsing, the fibers were then separated with a stamping mill. Waterwheel, windmill, horse, or human powered, these heavy wooden hammers beat the scraps of cloth into long, supple fibers of great strength.[15]

Preparing the natural or manmade material from which you make paper.

Beating or refining the material.

Forming the sheets.

Drying the sheets

Figure 3. Traditional Japanese papermaking.

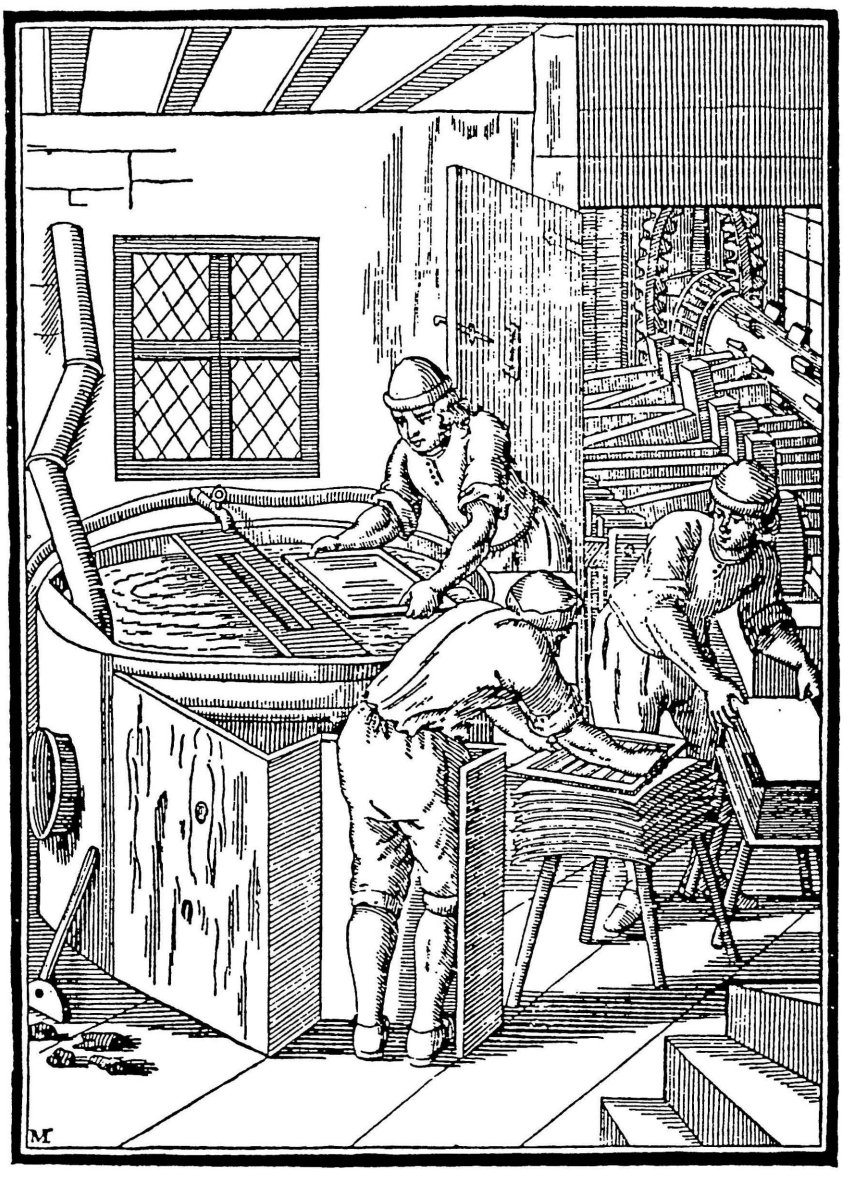


Figure 4. Traditional European papermaking.

This was a time consuming process, however, and it was slowly replaced by an invention called the Hollander beater. (See Figures 5 and 6.) This oblong, oval tub is fitted with a series of blades mounted on a cylinder which cuts and separates fibers much more efficiently than a stamping mill. The resulting paper is smoother, but it lacks the strength and suppleness of older European papers.[16]

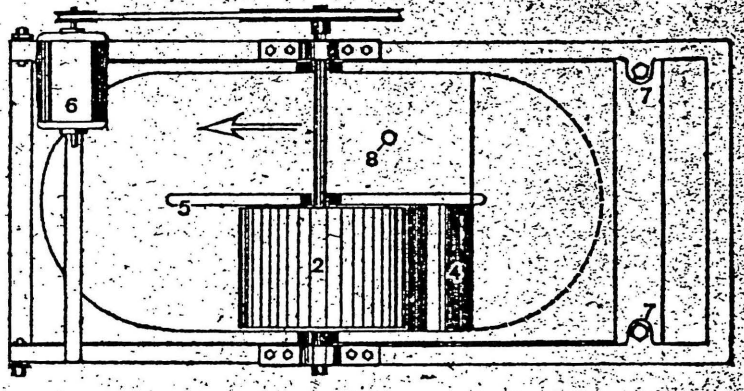
The beating process in pulp preparation is critical because it hydrates and separates the fibers, allowing each individual fibrous thread to develop fine fibrils along the strand which provide even greater hydration. (See Figure 7.) Paper isn't held together by glue, compression, or magic; it is the hydrogen bonding of individual fibers that occurs when cellulose is converted to glucose by hydrolysis in the beater. Cellulose pulp must be agitated frequently to keep the fibers suspended evenly throughout the vat and to prevent them from settling.[17]

The frame, or mold, and the screen are the supports used to lift pulp from the vat in the form of paper sheets. The pulp is contained on the surface of the screen with a deckle which determines the size and shape of the paper. It may also be divided to form more than one sheet of paper at a time. (See Figures 8 and 9.) Traditionally, the mold and deckle were made of mahogany with white pine ribs for reinforcement and support. Brass screens and nails were used for their noncorrosive qualities.[18] Today, all types of wood are used, the softer kinds being sealed with varnish to prevent warping. Stainless steel, aluminum and fiberglass screens are now available and are used in combination, a coarse mesh underneath with a finely woven screen on the surface that leaves little texture on the paper.

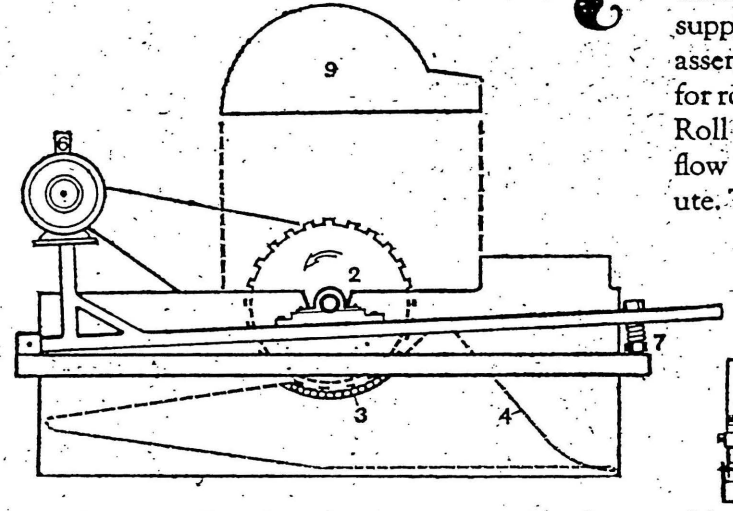
DER HOLLANDER

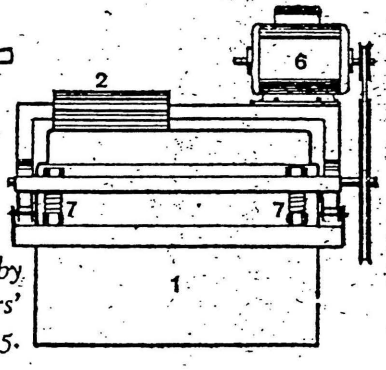
Being the beater of the Oak Park Press & Paper Mill at Wichita, Kansas, U.S.A.

1. *Tub; 18 x 36 x 14 in.*
2. *Roll; 13 in. dia. x 8 in.*
3. *Bed-plate*
4. *Back-fall*
5. *Mid-feather*
6. *Motor; .5 hp.*
7. *Clearance adjustment*
8. *Drain*
9. *Roll hood (removable)*



The tub is of wood, sealed with fiberglass, while the roll and bed-plate are of hard aluminum alloy. A steel chassis supports the motor and roll assembly, which is adjustable for roll-to-bedplate clearance. Roll turns at 290 r.p.m. Pulp flow rate: 6 circuits per minute. Tub capacity: 10 gallons.





This diminutive broadside has been conceived and executed by Jim Yarnell as a keepsake to commemorate the 1st Papermakers' Conference, at Appleton, Wisconsin, November 21 - 23, 1975.

Figure 5. The Hollander Beater.

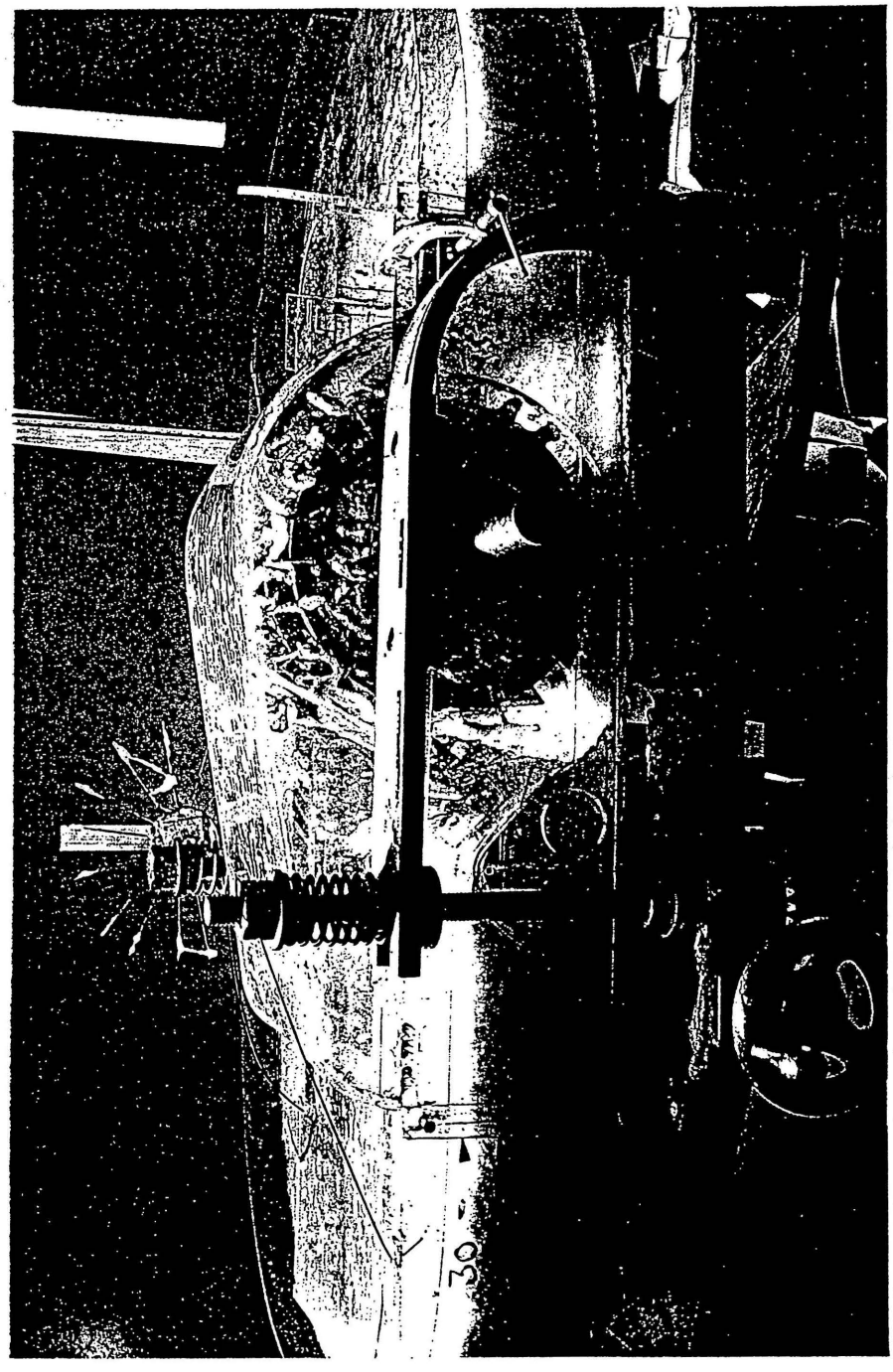


Figure 6. Douglass Howell's beater was made of plexiglass, enabling him to study the action of the beater rod and the circulation of the fibers. (Illustration is shown on end.)

Figure 7. Tiny fibrils on each fiber help in interlocking each sheet of paper. These fibers have been magnified 110 times with a scanning electron microscope.

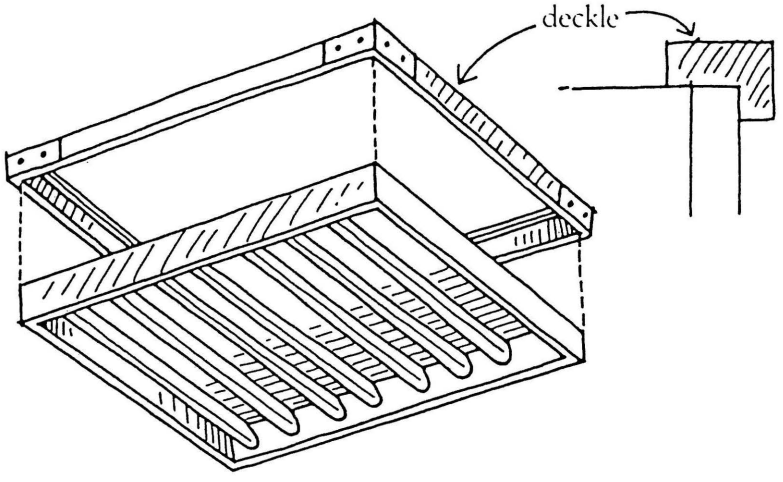
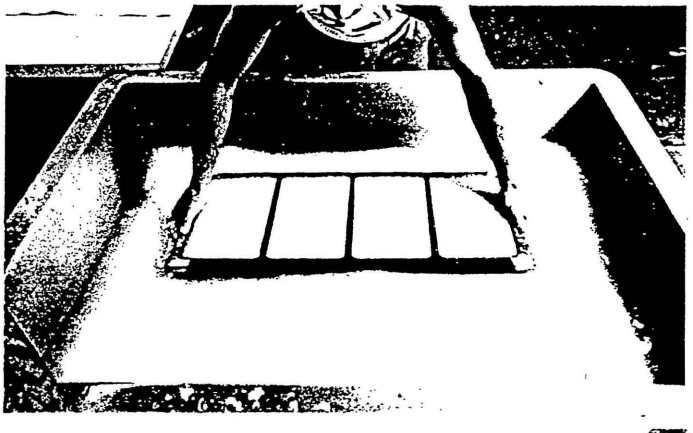


Figure 8. The mold and deckle with a close-up of the corner of the frame with the deckle in place.



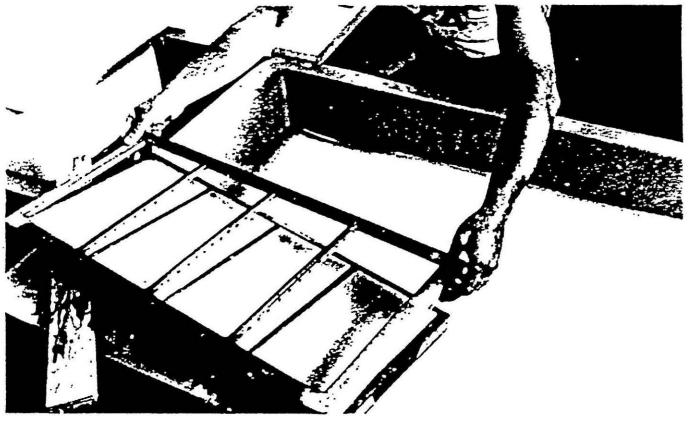


Figure 9. A divided deckle can make four sheets of paper at the same time.

Historically, the earliest European screens were called laid paper molds. Vertical brass wires were rigidly connected with chainstitched horizontals of horsehair of very thin wire. (See Figure 10.) Paper formed on these screens showed distinct shadows, or watermarks, when held up to the light. Watermarks are the result of variations in the thickness of the pulp caused by raised places, usually formed in wire on the surface of the screen. The parallel watermarks in laid paper were very noticeable in early lithographs and other prints. With the development of woven screens, a much smoother surface was available for printing.[19]

Wove paper was first made in 1755 and it is still being produced today. It is formed by placing the deckle over the screen where it fits down around the edges of the mold and is held in place by hand. The mold is then dipped into the vat of well distributed pulp at a shallow angle. The moment the mold is completely submerged it should be level and horizontal, just below the surface of the pulp mixture. A slight suction is felt when lifting the mold from the pulp and a "papermaker's shake" is given to align the fibers and aid in strong bonding. Water is allowed to drain through the screen and the deckle is removed, revealing a slightly uneven edge where some of the fibers slipped underneath the deckle. This "handmade" quality is further revealed when water is squeezed out during the pressing of the paper. (See Figure 11.)[20]

A variation on this method can be used when it isn't possible or desirable to fill an entire vat with pulp. A very deep, high-sided deckle called a deckle box is placed on the screen to contain the pulp which is poured directly onto the mold. The sheet formation proceeds in the same manner with the additional possibility of creating extremely thick sheets of paper.

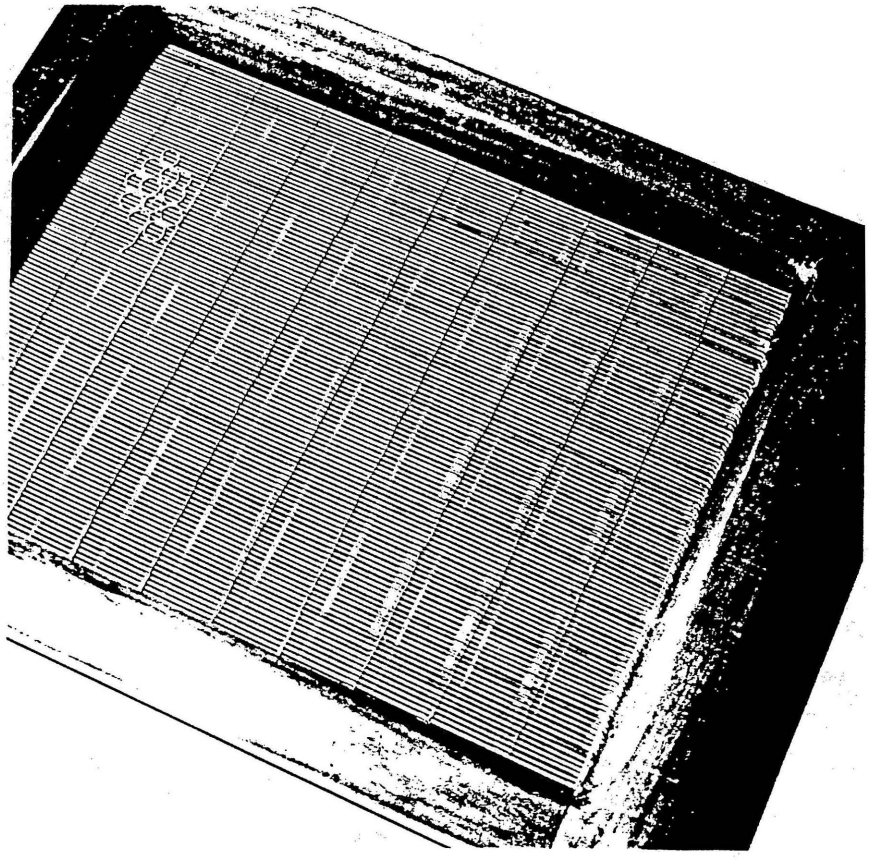


Figure 10. A hand-crafted laid mold. The wire grape design attached to the screen will form a watermark on the paper.

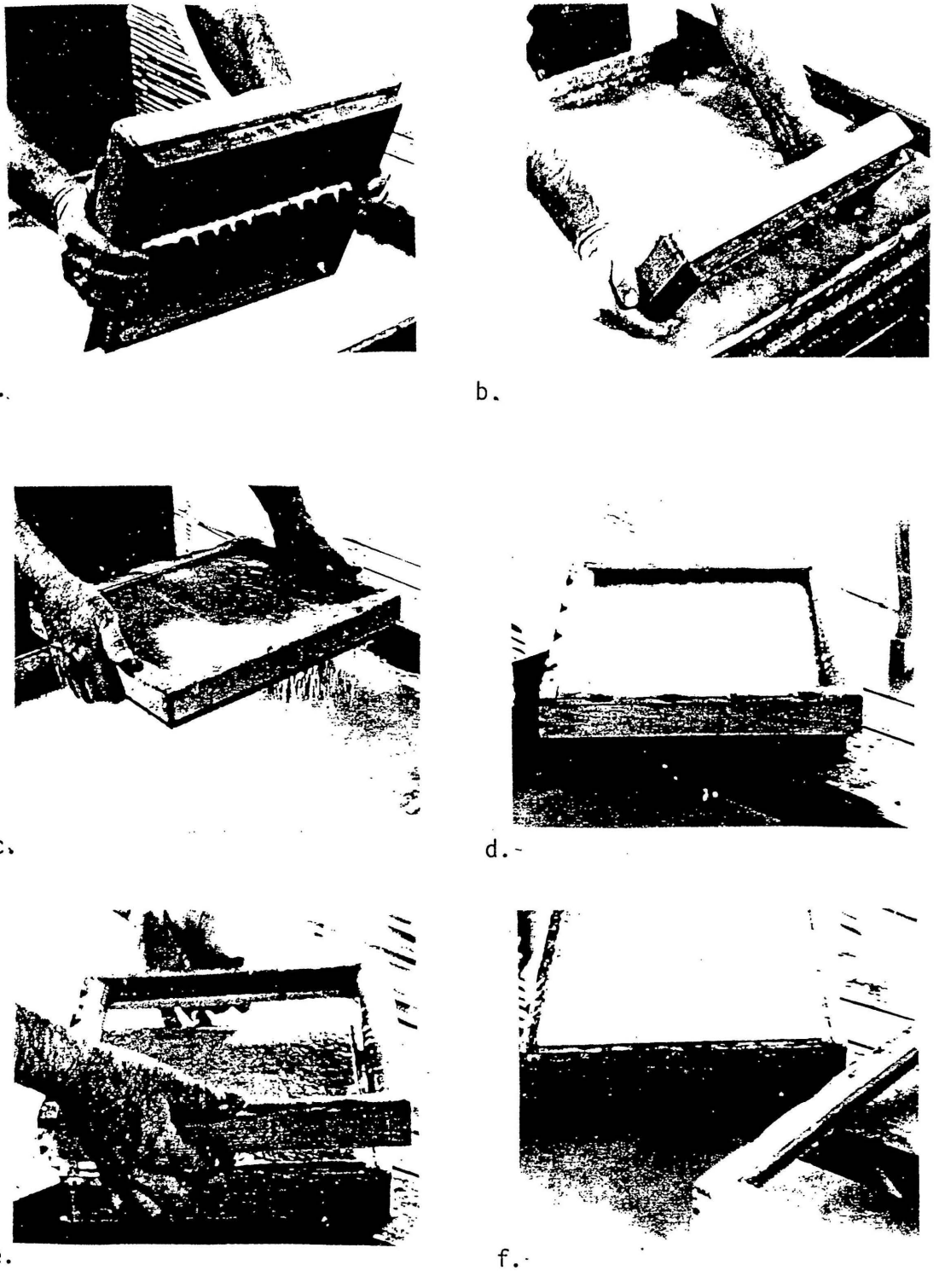


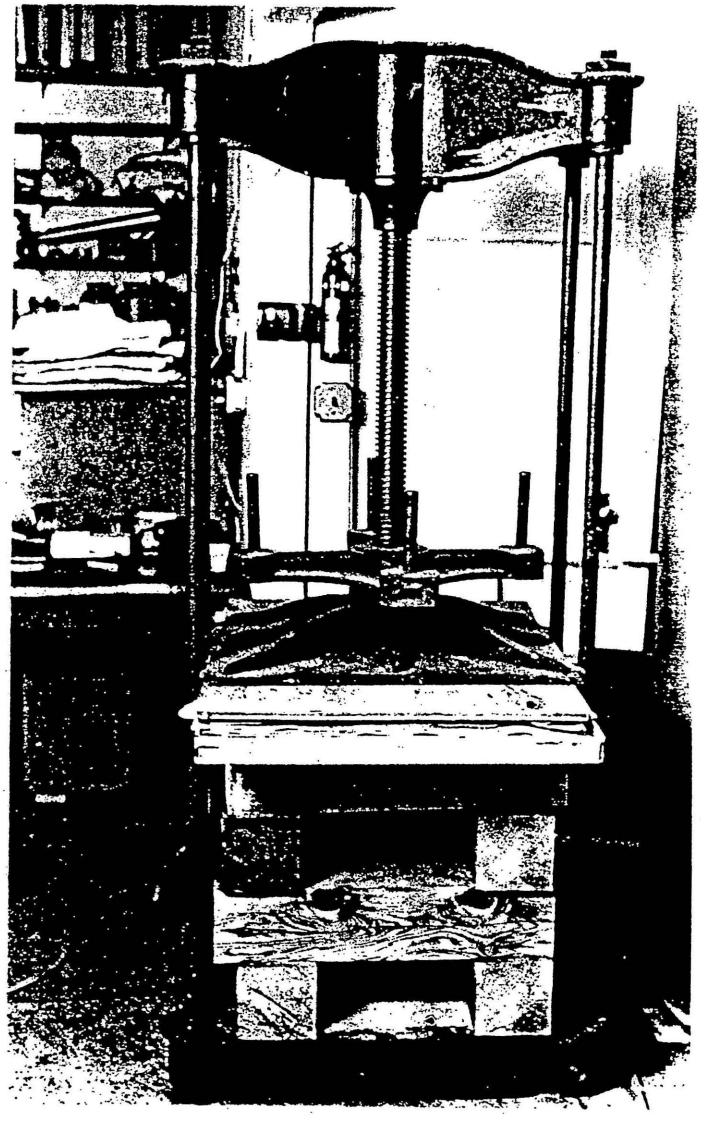
Figure 11. The formation sequence for making a sheet of paper.

After the water drains, the sheet is couched (pronounced "cooched") onto a dampened wool felt lying on a convex table surface. The mold is pressed onto the felt in a side to side, rocking motion which neatly removes the newly formed sheet of paper from the screen. Another felt is placed on the pile, ready for the deposit of the next sheet of paper. (See Figure 12.) As the paper and felts stack up they form a post which is then squeezed in a press to remove excess water and strengthen the bond between the fibers. Book binding presses have been the traditional device used in pressing newly made paper. (See Figure 13.) These heavy screw-type presses are still used extensively as well as modern hydraulic presses. A roller or etching press can also be used to obtain more uniform dryness or to impart texture to a paper surface more easily than pressing in a large pile.

After the initial pressing the damp paper is placed between dry felts and pressed again. The sheets are then stacked without the felts and are air dried or hung over ropes or dowels until dry. The resulting sheets are called waterleaf and will remain very absorbent unless they are sized. This isn't necessary if the paper will be used in printmaking since the inks used are stiff and tacky enough to remain on the surface. The softer, absorbent waterleaf will also print an intaglio better because it compresses and molds to the plate more easily than a stiffer, sized paper.

If paint or drawing ink will be used, however, their liquid nature causes them to spread and feather upon the paper. Sizing will prevent this from happening because of its water repellent nature. Various materials are used as size, including rice starch, gelatin, animal glue and synthetic resins. If the size is added to the pulp during the beating process, it is called stock sizing, which produces the most uniform

Figure 12. The rolling action during couching transfers the paper from the screen to the felts.



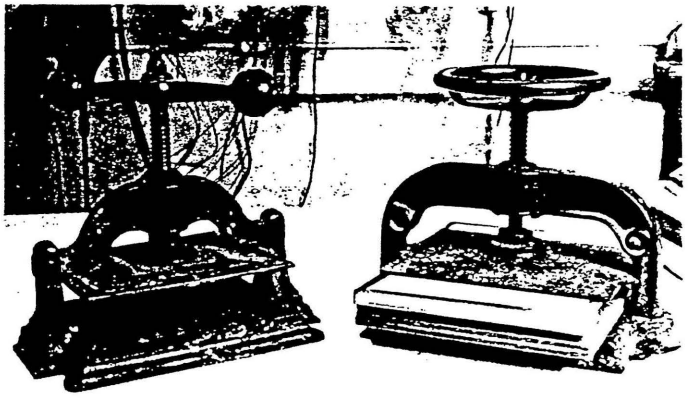


Figure 13. Large or small sheets can be pressed in book binding presses.

results. No more than five percent size should be added to the pulp, however, to prevent the inhibition of fiber bonding and the reduction of the strength of the paper. Size can also be applied to the paper after it is formed, which is called surface sizing. This method seals the exterior of the paper and provides a firm, smooth surface to paint or draw on.

Other variables that affect the surface of the paper are the quality of materials used for pulp, the texture of the felts and the fine or course texture of the screen. The paper may also be hot-pressed or cold-pressed with a series of polished metal rollers. Additives such as glitter, textile fragments or plant materials may also affect surface characteristics.

Each and every factor adds to the unique qualities of paper made by hand. Durable, high quality papers can be made by machine following essentially the same procedures as above, but there will always be some basic differences. Machine, or mold-made paper is formed on a revolving, cylindrical screen that produces a continuous web of paper. Due to this conveyor belt system, the fibers tend to align along the direction of movement. A good sheet of handmade paper has evenly interlocked fibers and will not tear more easily in one direction than another. Mold-made paper has a lengthwise "grain" and is stronger in that direction than at right angles to it. Machine-made paper will also stretch more easily when applying pressure across the grain than with it. Another major difference is that a deckled edge is formed only along the outer edges of the web of paper and the other two sides of each sheet must be cut or torn to simulate the natural deckle.

There are quality controls in commercially made artists's papers that the hand papermaker should be aware of when producing paper of

desired permanence. Durability is the result of many factors, one of the most important being the water. Impurities such as iron, chemicals and acids can be avoided by filtering the tap water. It should be neutral pH or slightly alkaline. Solid particles such as dry pigments, fillers, clay and sizes should be used in quantities of less than five percent so they won't interfere with the bonding of fibers. Only non-rusting fixtures and building materials should be used throughout the process.

Quality raw materials prepared to retain long fibers that are well hydrated make the most durable paper. Cloth fibers from cotton and linen rags provide the basis for traditionally sound papers. Linen has the best historical record for permanence. Cloth with wrinkle or spot resisters, and synthetic blends should be avoided because the fibers will not fibrillate or hydrate for bonding with other fibers. The resulting paper is weak and will yellow and deteriorate in sunlight, heat or acidic conditions. Synthetic fibers can be determined by burning the cloth, which will cause it to melt, or placing a piece in a glass of water where it will float instead of sinking as cotton or linen would do.[21]

Plant fibers from raw flax, hemp, gampi, kozo, and mitsumata are bast fibers obtained from the inner bark and make strong, durable paper. Most need cleaning and cooking to remove unwanted sugar, starch and lignin that would inhibit fiber separation during the beating process. If left in they would cause the paper to yellow and become brittle with age. Weak caustic solutions of one percent lye or washing soda are recommended to help prevent fiber damage. Longer cooking times are necessary with the weak solution but the resulting paper is stronger and smoother. Shorter plant fibers from leaves and grasses

will also work; however the paper will be rougher and more brittle than that made with bast fibers.[22] The characteristics of the fibers determine the final results to a great extent. They will drain differently on the mold, vary in surface texture and color, and appear more or less opaque. By blending different fibers and pulps, the desired qualities can be obtained for varying aesthetic needs.

Reprocessing old paper provides an inexpensive supply of materials for pulp. High quality cotton drawing and printmaking papers are the best source. The resulting paper will have a different character than the original due to the further shortening of the fibers. Endurance can be tested by repeatedly folding a sheet of paper. It may tear after two folds if not properly made or it can last over 18,000 folds in the case of some linen papers.[23] (See Figure 14.)

Another consideration to make when longevity is desired is the method used to color the paper. Natural colors can be obtained from various plant fibers that cannot be achieved with any other materials. Each has its own unique color that can be brightened with sunlight or lightened by chemical bleaching. Soaking in hydrogen peroxide and water several days is recommended over a quicker method using chlorine laundry bleach. The hydrogen peroxide leaves no residue on the fibers whereas chlorine remains in the paper and continues to oxidize the cellulose, causing the paper to yellow and become brittle over time.

Brighter shades of color can be obtained by adding colored pigments to the pulp in the beater. Pigments are finely ground natural or synthetic particles that act as fillers in the paper due to their water-insoluble nature. The inorganic earth pigments such as burnt umber, sienna, etc., have excellent lightfast qualities. Synthetic pigments have greater brilliance but vary in lightfastness and tend to

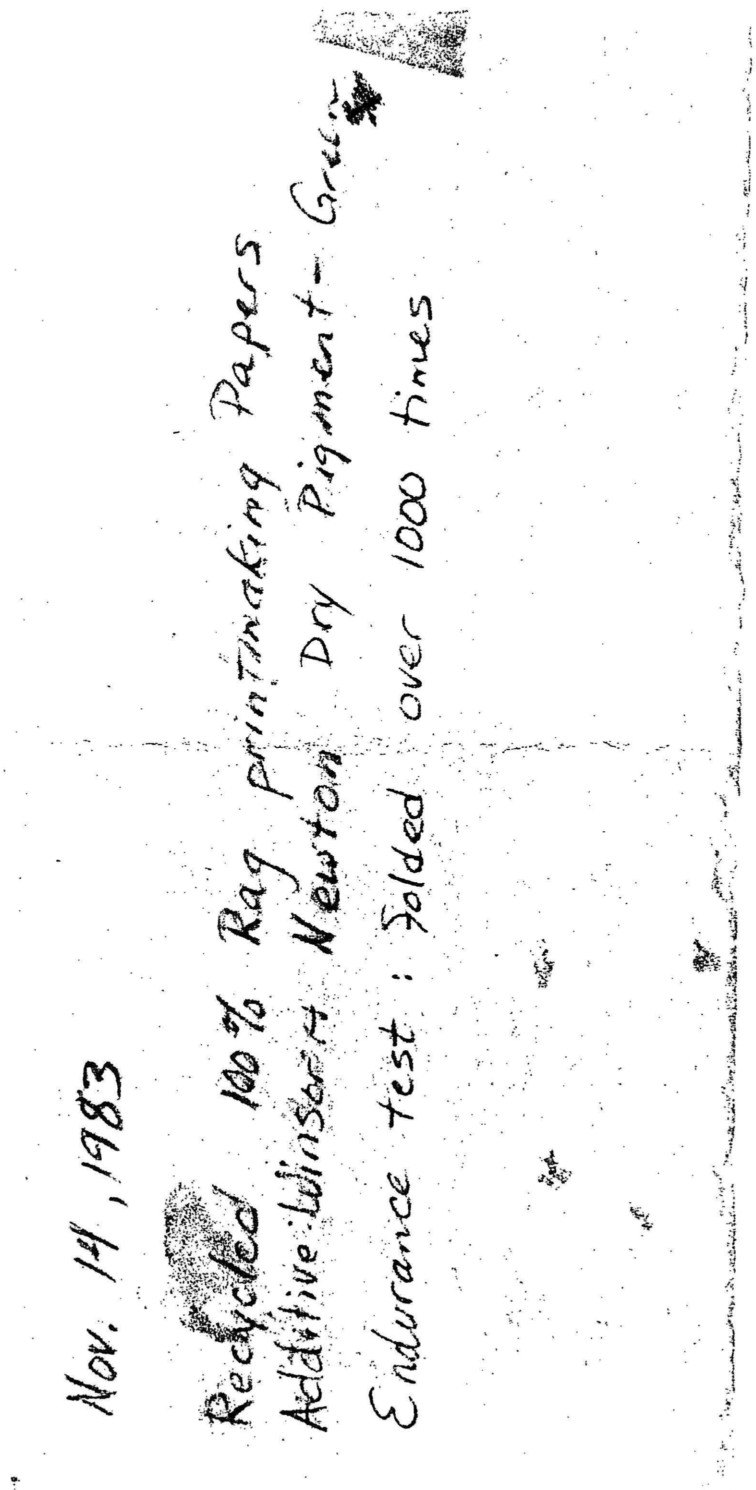


Figure 14. Handmade paper put to the test.

bleed out of wet sheets of paper. Industrial retention agents are available to bind the colors to the fibers and are useful with deeply colored pulps. Dry pigments should be made into a paste with water before adding to the beater and once added they should be mixed frequently to prevent settling. (See Figure 15.)

Another type of coloring agent is dyes. They are water soluble and will not settle out because they penetrate the fibers themselves. Dyes are less lightfast than pigments, but will not interfere with fiber bonding or the strength of the paper. Separate batches of pulp can be dyed with different colors and blended together to create a new color. Each fiber will retain its original color and the unique visual qualities of each type of fiber can be greatly enhanced.

Three types of dyes are appropriate for cellulose materials: direct, fiber reactive and natural dyes. Direct dyes are bright in color and salt is used to mordant the dye. The fibers muse be thoroughly rinsed after the color is set. Fiber reactive dyes chemically bond with the fibers to provide the best lightfast qualities. Those most commonly used are procion dyes which require washing soda to set. This leaves the pulp very alkaline, necessitating a thorough rinsing to neutralize it. Natural or vegetable dyes create subtle, beautiful colors but some are very fugitive. Experimentation is the rule with these materials. It should be noted that the usual fiber used with natural dyes is wool and most of the mordants for bonding dye to the fibers should be avoided. Retention agents may help in bonding certain natural dye colors.[24]

Various colored pulps can be combined in a single sheet of paper by using shaped deckles on the surface of the screen to separate color

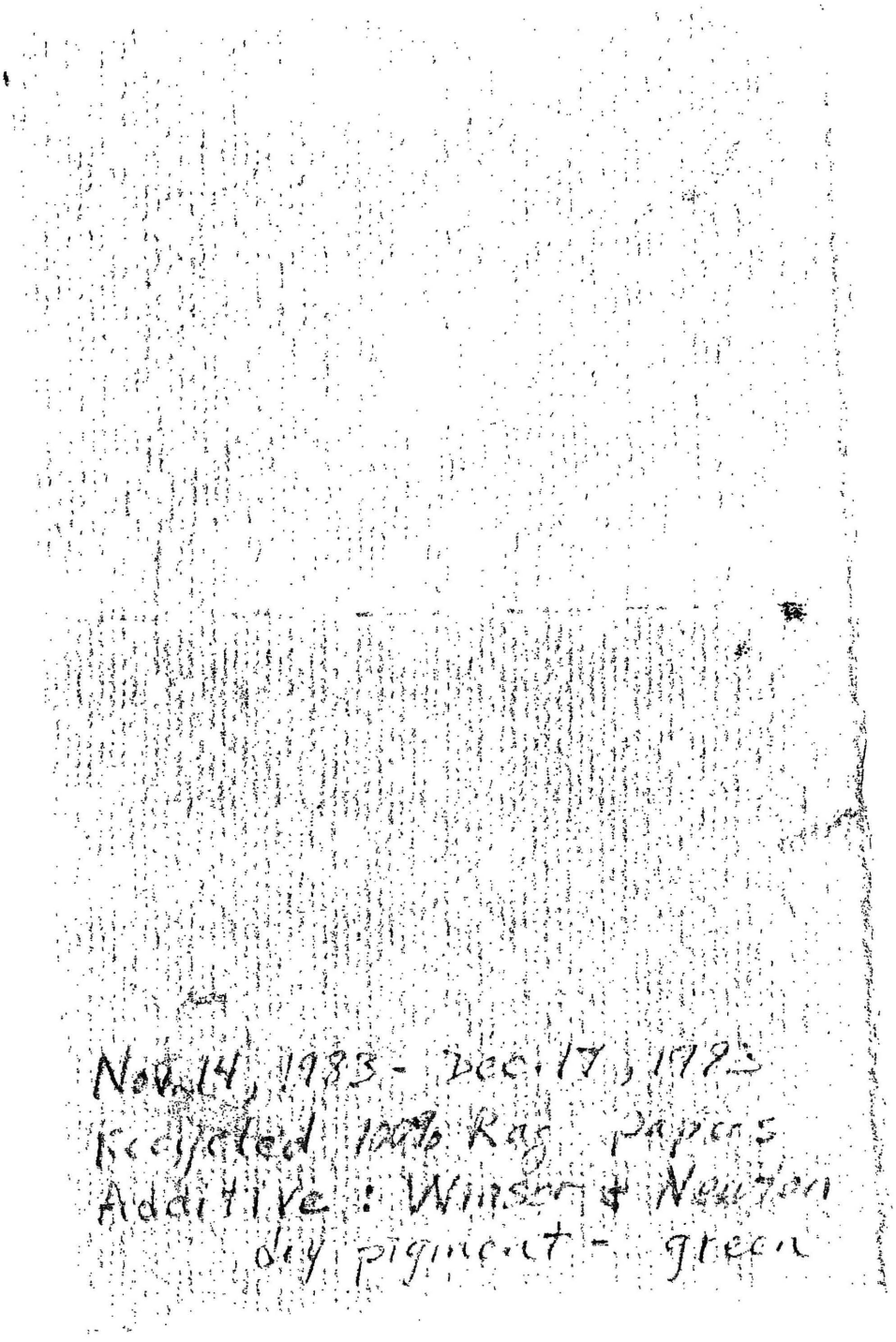


Figure 15. The upper portion of this pigment colored paper was exposed to direct sunlight over a period of about one month, showing no significant fading.

areas. Pulp can be pressed or poured into each area and connected after removing the deckles from the still wet pulp. Layers of different colored papers can also be laminated one on top of another, taking advantage of paper's natural bonding characteristics. Images can be created in the wet pulp just after removing the screen from the vat. Each layer is then couched onto the previous layers in the normal manner.

Paper produced especially for printing on has unique specifications to take into account. Since it is difficult to make a paper suitable for all printing processes, the intended use should be known before beginning the papermaking process. Different levels of water-resistance, receptivity to ink, tendencies to stretch or shrink, and the importance of pH balance should be taken into account.

Relief printing paper must be especially smooth, even and level. It should be highly receptive to ink and resilient enough to assume its original shape if successive color printings are intended.

Intaglio printing paper should be on the soft side, fairly smooth and absolutely level with no surface irregularities. It should also be resilient, very absorbent (no sizing is needed) and strong enough to withstand extreme pressure without tearing or cutting even while damp.

Planographic, or lithographic paper comes into contact with fair amounts of water and must have great internal and surface strength. Sizing in the beater and after drying adds strength and improves water resistance. It should also be very flat, even and fairly hard. A pH neutral value is especially necessary in lithography due to the ability of an acidic paper to cause scumming in the nonprinting areas of a lithographic image. With the opposite extreme, an excessively alkaline paper may cause tinting as it neutralizes the slightly acidic level of

the fountain solution used in the dampening water. A uniform tint appears in the open areas and the ink may begin to bleed.[25]

Screen printing paper has few special requirements due to the adaptability of the medium. The stencil process needs a reasonably stiff paper that is fairly heavy in weight. Extra sizing may be required if using water-base or acrylic inks.

In the recent past, the production of paper suitable for printing on has largely been in the hands of commercial mills. They provide uniformity, technical and mechanical perfection. These well-known mold-made papers are readily available and give little incentive to make one's own paper, unless one believes in Douglass Howell's statement, "If you want to make art sing, you have to have the right paper."[26]

Any kind or quality of paper directly affects the image put upon it. The relationship between an image and its support, figure and ground, plays an active part in any contemplation of a print, drawing, or painting. Placement of the same image on a sheet of smooth, bright paper, off-white, cream or grey paper, textured or slick paper, even any one of the 148 shades of Strathmore's white drawing papers will create a unique work of art. For the artist who looks at paper as not just a surface for creation, but as part of creation itself, the making of one's own paper is essential. It may be part of a search for uniqueness that can be brought to one's art. Handmade paper can certainly fulfill any desire for variety in color, texture, weight, size and shape. Furthermore, as Lawrence Barker wrote from his studio in Spain, "Papermaking is fast, clean work, and there should still be plenty of time to be an artist."[27]

III. CONTEMPORARY USES, IDEAS AND IMAGES

Within the past ten years or so there has been a shift in attitude toward the medium of paper. Along with canvas and stone, paper has always been a universal material in the world of art. Lately, artists have become more aware of the relationship of image to support and the consideration of paper as a substance in and of itself has emerged. Today a sheet of paper can be an aesthetic image as important as anything drawn or painted on its surface.[28]

This change in attitude that gives paper a place of its own in the art world seems to have begun in the fine art print studios with a search for greater supplies and a variety of high quality, novel papers. Artists and papermakers began ignoring paper's traditional support function completely and explored the potential of the substance itself. Eventually their attitude spread to artistic and educational communities, expanding the aesthetic boundaries of the medium wherever it went.

Diversity in the "new" paper medium has been encouraged by the establishment of numerous small mills and studios around the country. One of the originals and a major contributor to the revival of hand papermaking was Twinrocker. Since 1972, Kathryn and Howard Clark's mill in Brookston, Indiana, has been actively producing paper with a balance of tradition, craftsmanship and artistic innovation. (See Figure 16.) They have created custom-made paper for artists and

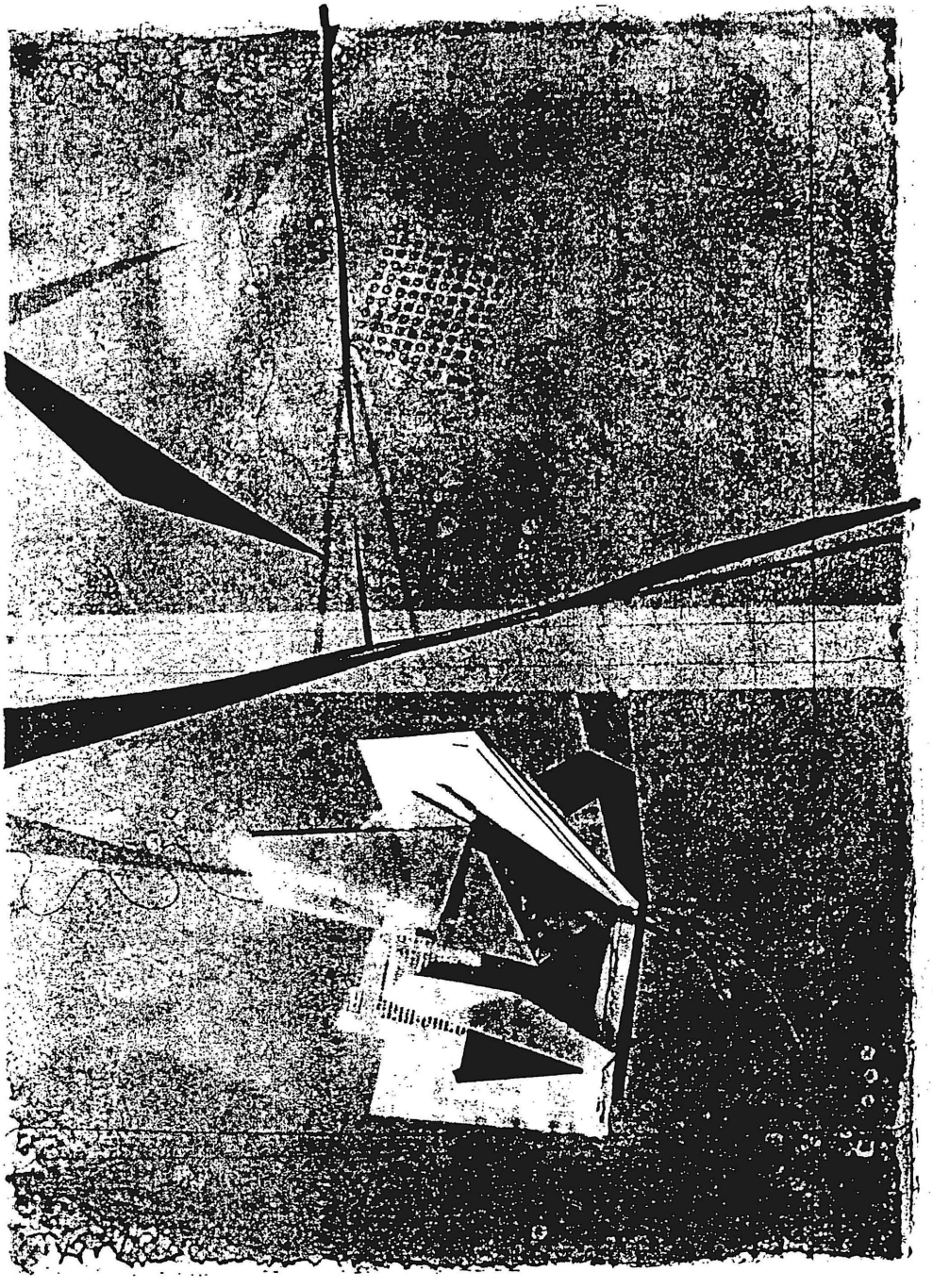


Figure 16. Kathryn Clark is a professional papermaker and artist. Here, Which Comes First - Book or Page, 1982, 34 x 48 inches. (Illustration is shown on end.)

printmakers such as Jim Dine, Robert Rauschenberg, Jasper Johns, Robert Motherwell, etc.

On the West coast, a major influence has been Garner Tullis' Institute of Experimental Printing (see Figure 17), while on the East coast the Dieu Donne Press and Paper, Inc., has provided an inventive influence on the papermaker's art (see Figure 18).

Experimentation and improvisation appear to be the rule rather than the exception with artists creating in paper. For as many artists as there are working, there are that many approaches to using handmade paper.

A wonderful uniqueness can be found in the approach of seventy-five year old Mildred Fisher. She studied in Japan with Eishero Abe, the Living National Treasure in Papermaking. When she returned to her studio in Cincinnati, Ohio, she began cutting up her older linen tapestries for pulp.

"Her colors come from dyed cloth. For water, she collects rain. For a press, she uses a piece of plywood and sixteen bricks. Her beater has chipped blades and the resulting pulp has a rich mixture of long and short fibers which enhance the resulting images and give them greater depth."[29]

In contrast to this richness are the works of Winifred Lutz. A mood of Oriental serenity pervades her translucent, mysterious scroll pieces. She makes her pulp from fibers such as sisal, jute and milkweed silk and utilizes their natural transparencies in very thin sheets of paper.[30] (See Figure 19.)

A similar mood of fragile mystery can be found in the works of Nance O'Banion, a San Francisco artist. Her two dimensional pieces

Figure 17. Garner Tullis is a master printer, papermaker and artist. This piece is entitled, Zabie, 1976, 24x24x10 inches, pulp and gauze.

Figure 18. Artist Kenneth Polinskie working at Dieu Donne Press and Paper, Inc.

Figure 19. A paper piece by Winifred Lutz entitled, First Reading, 1976.

contain bamboo structure that allow them to function in a three dimensional space, enhancing the illusive movement of surface elements interacting with light and atmosphere. Her respect for Japanese tradition is evident in her belief that technique and aesthetics can achieve a cultural balance which allows many elements to exist simultaneously without compromise.[31] A combination of craft tradition and aesthetic imagery create just such a balance of dualities in Nance O'Banion's pieces. (See Figure 20.)

Kenneth Noland, on the other hand, is attracted to paper's qualities of unity. His personalized combinations of colored pulp surfaces create a physical presence that exists more strongly than any illusion on the surface of the paper could. (See Figure 21.)

The unique qualities of paper cause artists to be drawn to its immediacy, malleability and flexibility for expression. Pieces can be created in both two and three dimensions, in an astonishing variety of colors, in editions of multiples or as unique, individual works of art. There is an inherent simplicity in the craft of papermaking, yet there is potential for intriguing complexities in the art of papermaking.

Delicate or massive, immediate or vast, perhaps the deepest understanding of the substance of paper itself can be found in the paper pieces of Douglass Morse Howell. (See Figure 22.) He combined a Far Eastern perspective with European traditions to achieve a unique integrity that brought out what was inherently natural in the materials, process and aesthetic direction of the paper itself. His papers seem to have a life of their own, not unlike objects in nature. They bring, "memories of rocks or cloud-filled skies, challenging your degree of vision, but never exhausting itself.

"The simple is so difficult of understanding, unless you understand your materials, you cannot climb the mountain to a still higher understanding."[32]

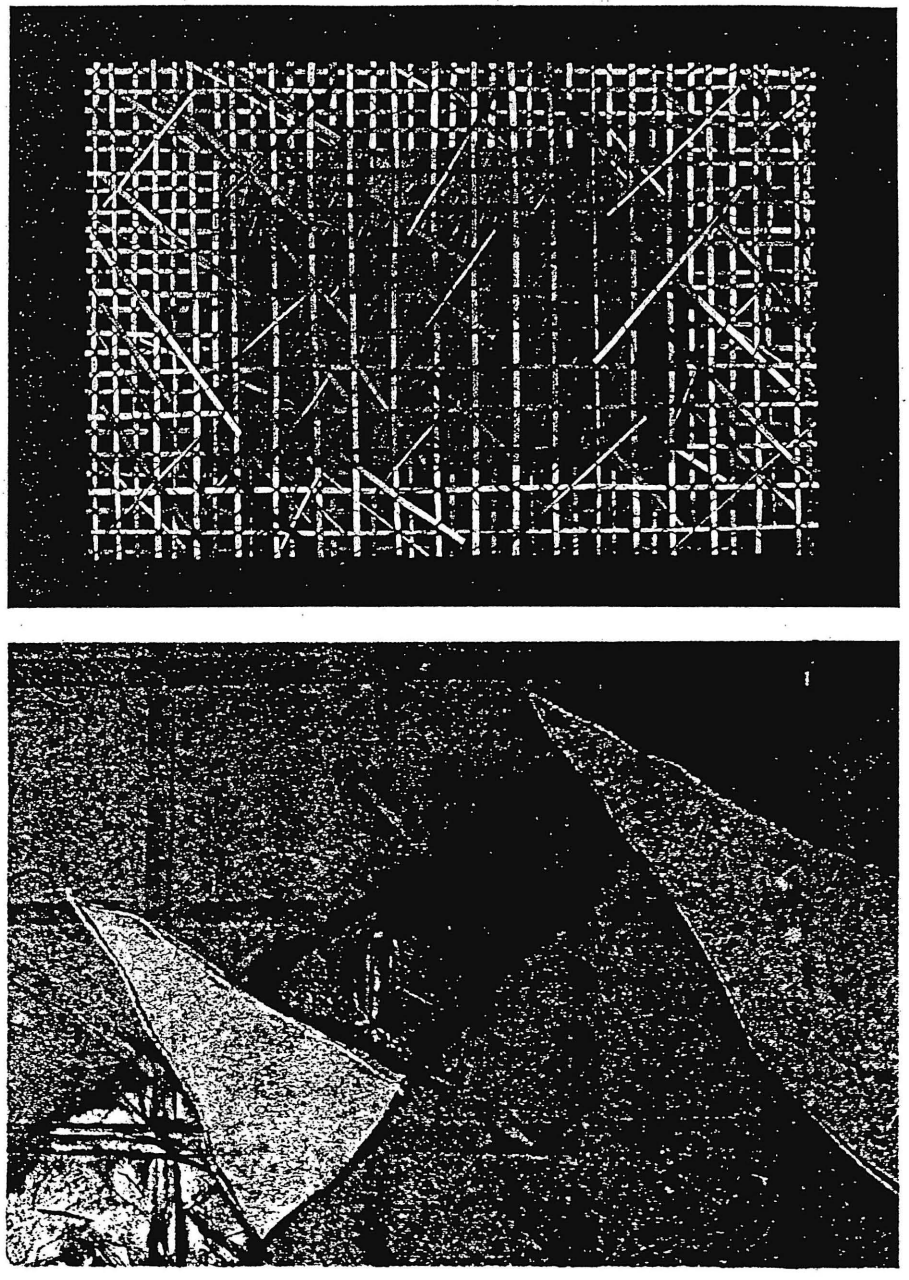


Figure 20. Two examples of Nance O'Banion's pieces. Above, Traps: Red Horizons, 1982, and below, Points and Clouds in Mauve Light, 1981 (detail).

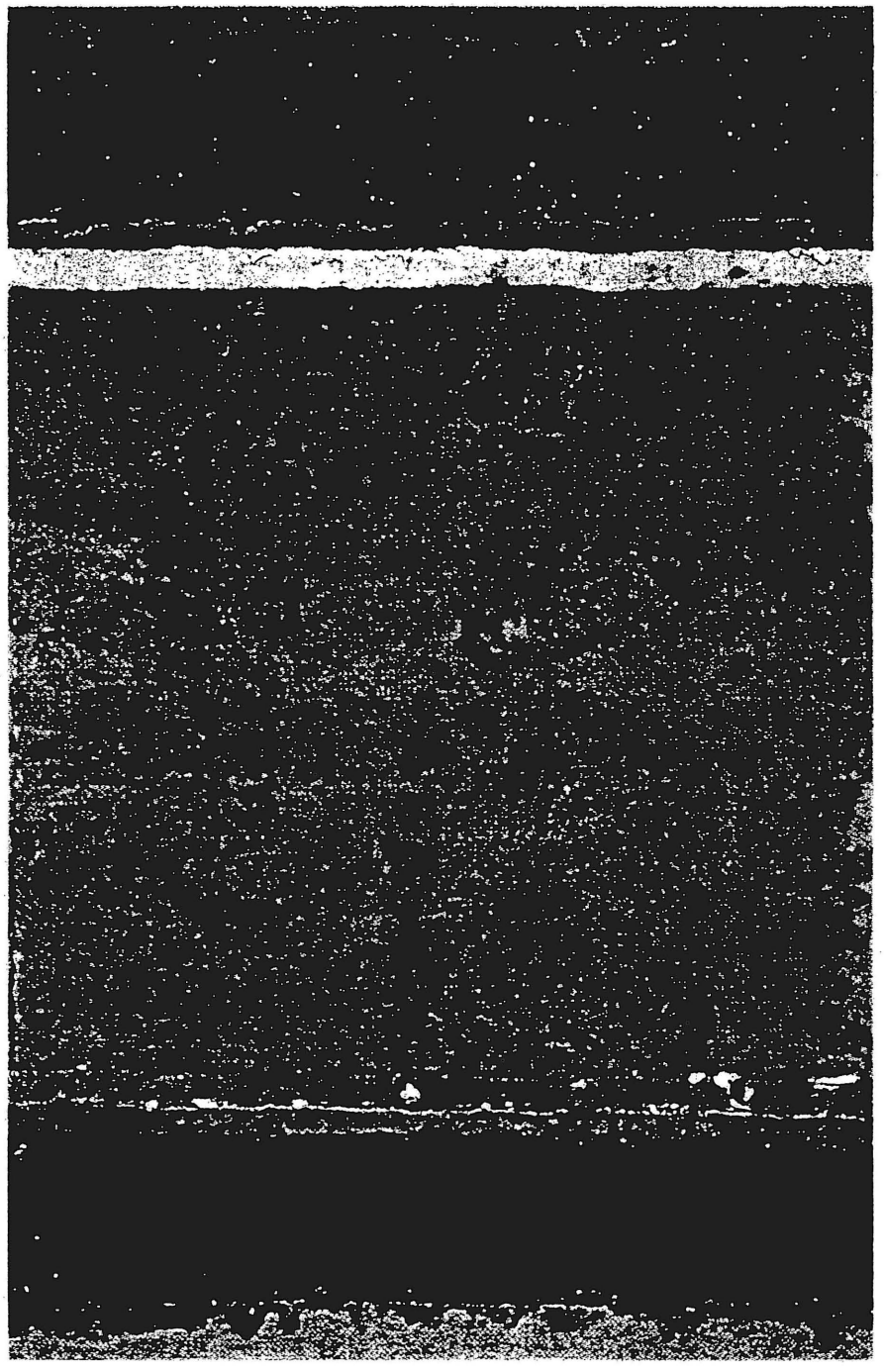


Figure 21. Horizontal Stripes, 1978, by Kenneth Noland was created by forming each colored band on separate molds and laminating them together.

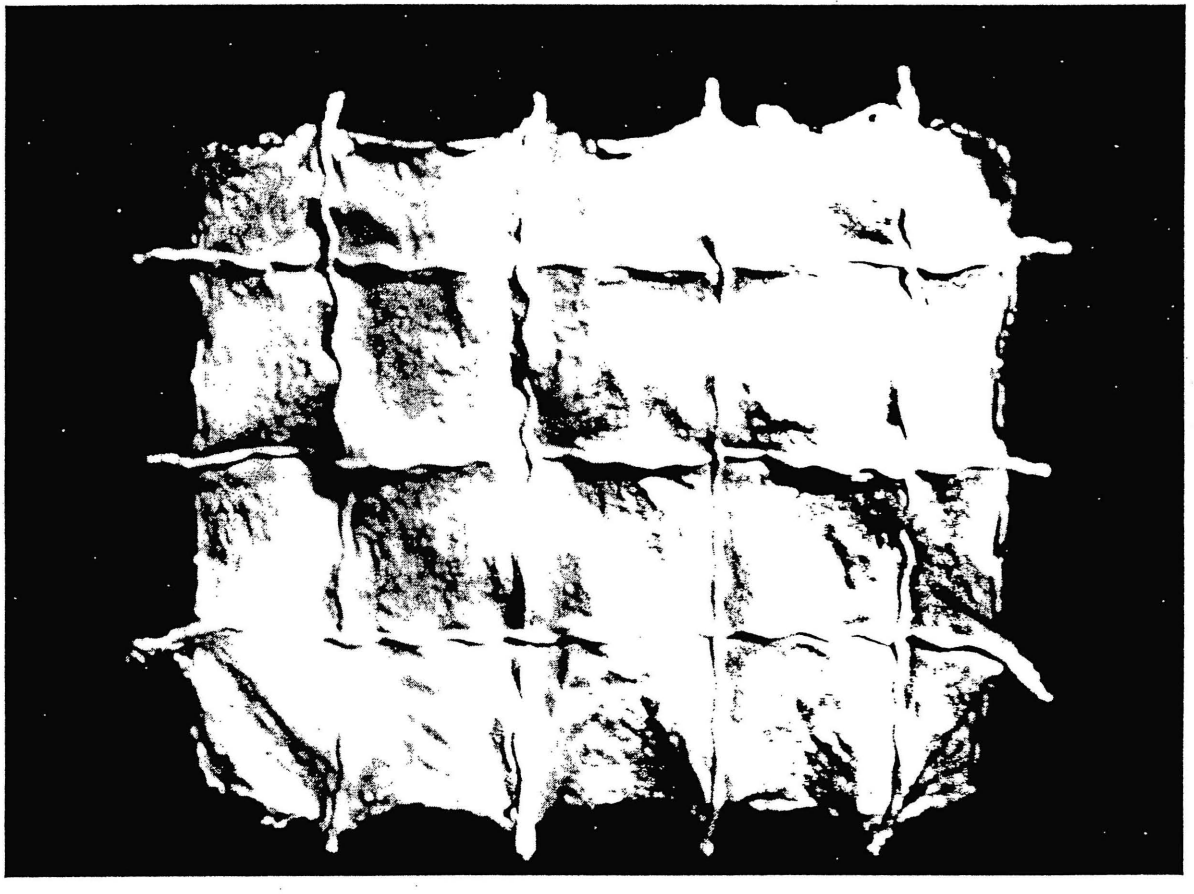


Figure 22. An artwork of Douglass Morse Howell's.

ENDNOTES

[1]John Perreault, "Paperworks", (American Craft 42:2-7, August/September, 1982), p. 3.

[2]Deli Sacilotto and Donald Saff, Printmaking - History and Process, (New York: Holt, Rinehart and Winston, 1978), p. 372.

[3]Jules Heller, Papermaking, (New York: Watson-Guptill Publications, 1978), p. 23.

[4]Ibid., p.23

[5]Ibid., p.187

[6]Ibid., p.187

[7]Ibid., pp. 190-194.

[8]Bernard Toale, The Art of Papermaking, (Worcester, Massachusetts: Davis Publications, Inc., 1983), p. 5.

[9]John Brzostoski, "Douglass Morse Howell-Scholarship, Skill, Vision", (American Craft, 41:2-5, February/March, 1981), p. 4.

[10]Ibid., p.4

[11]Heller, p. 85.

[12]Jo Yanow, "New Dimensions in Artists' Materials", (Art News, 82:123-144, October, 1983), p. 130.

[13]Heller, pp. 165-168

[14]Ibid., p. 187.

[15]Sacilotto and Saff, p. 374

[16]Ibid., p.374

[17]Heller, p.23

[18]Ibid., pp.68-69

[19]Ibid., p.24

[20]Ibid., pp. 42-46

[21]Toale, p. 46.

[22]Alexandra Soteriou, "Conserving Handmade Paper," (American Craft, 42:11-12, August/September, 1982), p.11.

[23]Ibid., p. 12

[24]Toale, p. 56.

[25]Heller, p. 111.

[26]Brzostoski, p. 4.

[27]Heller, p. 125.

[28]Deborah Pines, "Twinrocker: Fine Papermaking in America", (American Craft, 39:16-19, October/November, 1979), p. 16.

[29]Toale, p. 35.

[30]Heller, p. 143

[31]Mary Stofflet, "Nance O'Banion: Illusions and Ambiguities", (American Craft, 42: 16-19+, June/July, 1981), p. 19.

[32]Brozostoski, p. 4.

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