

Treatment of an Oversized, Hand-Drawn Shaker Map

by Patricia Dacus Hamm*

Description

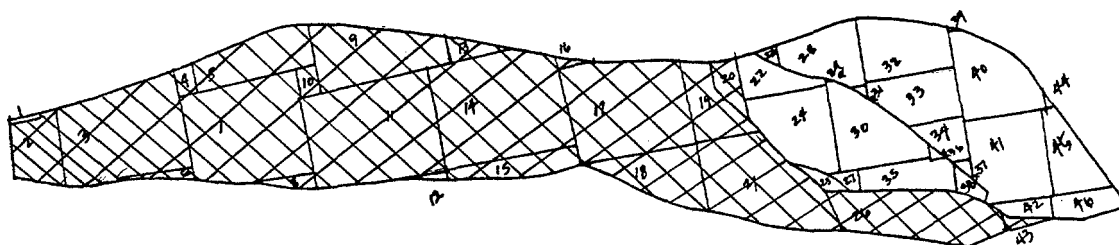
Rarely have I encountered such a unique work of art as the David Parker Shaker Map, signed by the Shaker artist, David Parker, and dated 1849.

Not only was it an unusual size and shape, but it had also been drawn with exceptional care to illustrate the route for delivering Shaker goods surrounding the Shaker Village.

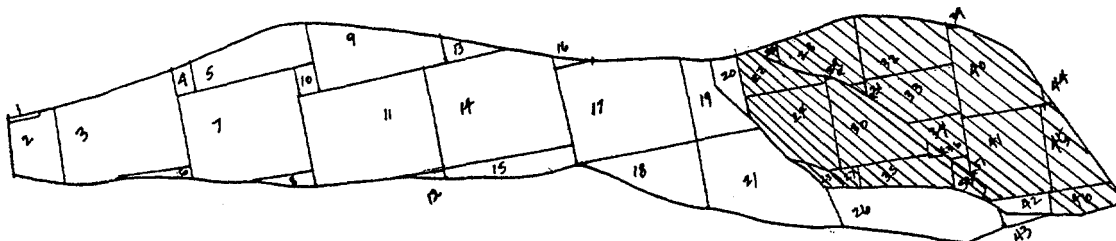
The Map had been recently reacquired after many years by the Shaker Village, Inc., now a museum complex in Canterbury, New Hampshire. Its condition was such that it could not be safely exhibited without treatment.

The Map is 15 feet and 10 inches wide and varies from 12 to 36 1/2 inches tall. It is composed of 46 sheets of paper of four types which are all joined with overlaps.

I have labeled the most frequently occurring types of paper "A" and "B".



1. Type "A" Papers.



2. Type "B" Papers.

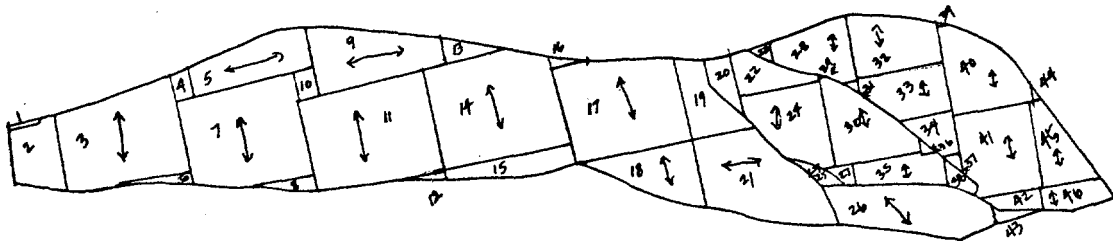
"A" is a lightweight, ivory, moderately textured, wove paper of excellent strength. "B" on the other hand, is an embrittled ledger paper with printed ruled lines. It is lightweight, light tan color, slightly textured and wove. Fibers from both papers test negative for woodpulp composition using phloroglucinol stain. No watermarks are present. The surface pH of "A" was 5.5, and "B" was 4.5.

There were several adhesives used in the construction and past restorations of the Map, all of which were flour pastes of various compositions and degrees of purity.

When joined together the "A" papers had been skived at the verso edges for approximately 1/8" and adhered with a strong flour paste. The "B" papers were simply pasted on the overlaps.

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Although several sheets of paper in the composition were left nearly whole, the grain directions of the sheets were not aligned in the same orientation. A good deal of planar distortion throughout the Map was attributable to this inconsistency.



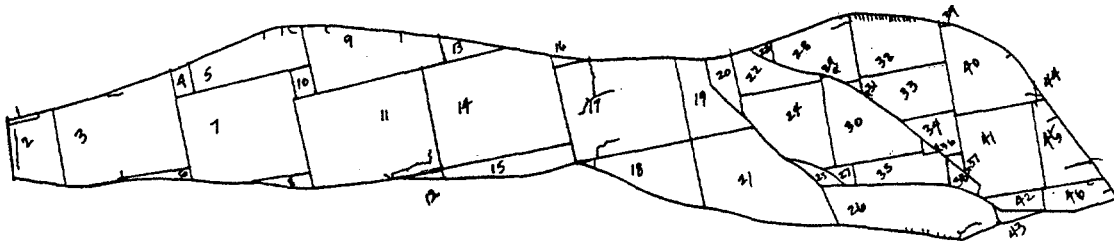
3. Grain Direction

Watercolor or colored inks and iron gall ink applied with a pen over pencil lines constitute the media except for one wash area illustrating a pond. Measurements, names of roads, buildings with owners' names, and accurate renderings of houses and landscape make this Map an invaluable tool for research.

For many years the Map had been taped to the wall in a lumberyard office preceding its requisition by the Shaker Village. There was much evidence of this previous exhibition to be seen when the Map came to my laboratory tightly rolled in the Spring of 1986.

Examination

The Map had suffered from previous restorations, poor exhibition and improper storage. Its size and irregular shape actually predisposed it to certain damages such as tears in the narrow areas, edge crushing, and creasing caused by rolling.

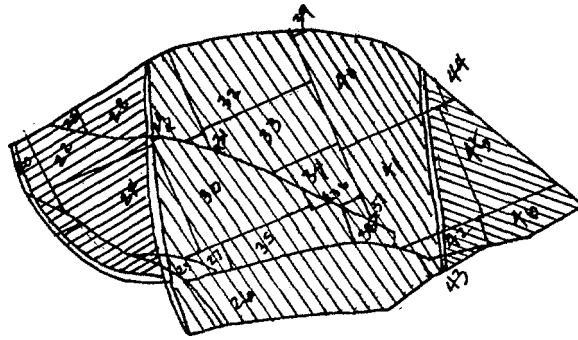


4. Tears

Previous Restorations

The edges had been reinforced on the verso with either paper or fabric strips. These materials had stained the original papers. Rippling and breaks on the original were present at the inner edge of the reinforcing strips. They had been caused by differences in expansion between the double layer of the reinforced edges and the single paper of the original Map.

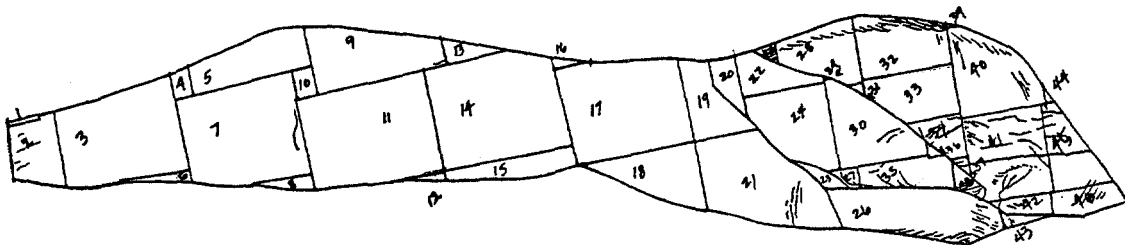
On the front, the "B" paper appeared extremely distorted telling of the two previous fabric linings on the verso.



5. Linings on Verso of "B" Papers

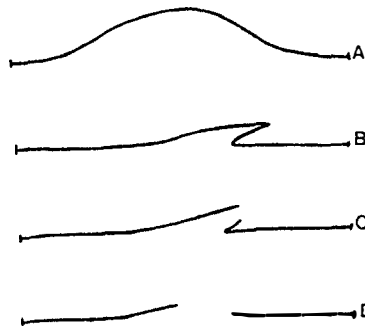
The problems caused by the fabric linings were in part the result of the tendency of the "B" papers to expand a great deal upon contact with water. This aspect of the papers was the single most important characteristic influencing the design of the treatment. It ruled out the use of synthetic patching adhesives, which do not expand with the paper; it necessitated the use of low moisture adhesives; and it ruled out new linings, which could complicate the already overly complex structure of reactive paper and less reactive overlaps.

The previous lining fabrics had been irregularly coated with a thick and lumpy layer of flour paste and simply placed on parts of the verso of the "B" papers. Immediately following attachment, it appeared that the "B" papers expanded where they could, mostly between the overlaps. Since the overlaps did not expand as much as other areas of the paper, a billowing effect was caused between them. Further complicating the matter, the Map was flattened. The expanded areas between the overlaps became a complex of creases, ripples and bunching, which were all locked in by the excess adhesive.



6. Creases

As time passed the tops of the creases were abraded away leaving patterns of long, narrow losses.



7. Progression of Expanded Paper Through Crease to Loss.

Developing the Treatment

The first decision regarding the treatment was one of degree. The "A" papers appeared stable and only slightly disfigured. Despite planar distortion at the overlaps, the risk of detaching the sheets merely for minor flattening purposes seemed unjustified.

The state of the "B" papers was beyond acceptability. So different was their condition from the "A" papers that it seemed necessary to design completely different treatments for the two sets of papers.

Risks

The distortions in the "B" papers could not be diminished unless the fabric linings and associated adhesive were first diminished. This would necessitate the use of water, and the media were water sensitive.

Secondly, to diminish the distortions would require releasing certain overlaps in the "B" papers to realign the previously expanded papers. Detaching the overlaps of a multi-sheet composition is highly risky. Papers expand differently when bound at the edges than when loose, even if they are not directly exposed to water during the treatment. Papers can expand along one dimension more than another, whether they are handmade or machine made.

There was no way to precisely predict the new dimensions or the new alignment of the sheets after detaching them. Drawn across two of the sheets requiring detaching were roads which should connect after treatment.

Fully informed of the risks, the Museum's staff and the conservator were able to successfully produce a mutually acceptable treatment proposal. The following is taken in part from the Laboratory Treatment form.

Treatment of "A" papers

Mud splattered areas were locally drycleaned. A small, stiff-bristle brush and slight moisture were used to further diminish the mud. Masking tape adhesive residue was diminished with a scalpel. Staining and migrated adhesive remained. Gray paper edging, gummed Holland tape, white paper edging, fabric edging and paper patches were removed using slight moisture (Samples of these papers were retained.) Adhesive residues were diminished with slight moisture.

N, n, dimethyl formamide, methyl ethyl ketone, toluene and acetone diminished remaining adhesive residue. Only minor staining remained.

The verso and selected areas of the recto were drycleaned avoiding friable media.

Inserts for losses were shaped from lightweight Rives, ivory, wove paper and attached with wheat starch paste and patched with Kizukishi paper and wheat starch paste.

Tears were cleaned, aligned and patched using Kizukishi paper and wheat starch paste.

Treatment of "B" papers

Fabric linings were removed by shearing them off in thin strips. The adhesive residue was diminished using a scalpel and fine sandpaper. The residue was still much in evidence afterwards, especially in creases and ripples. The adhesive appeared to be locking in the irregularities. There were numerous areas where paste had been applied thickly. The paper in these areas was puckering.

The overlaps were detached between the "A" and "B" papers with the aid of a microspatula and moisture. Selected internal overlaps were detached to release creasing, rippling and bunching. Not all overlaps were released. The adhesive at the overlaps was diminished with slight moisture and a microspatula.

Masking tape adhesive residue was diminished with a scalpel and heat. Staining and migrated adhesive remained.

Gray paper and fabric edging were removed using slight moisture.

1:1 toluene and acetone were used to diminish remaining masking tape adhesive residue.

The media of the "B" papers was consolidated with a fine brush (000) using 12% Rohm & Haas co-polymer of ethyl methacrylate and methyl acrylate (Acryloid B-72) in toluene. A 5% solution in toluene was applied to wash areas using a fine air brush while masking out areas not to receive spray. The consolidant was allowed to dry overnight. The consolidant made no visible change in the media.

The adhesive residue on the verso of the "B" papers was diminished using deionized water locally and later by immersion. The removal process followed by immersion in a 1:1 solution of saturated calcium hydroxide and deionized water. The "B" papers were air dried on polyester batting.

The "B" papers were lightly flattened beneath wool felts; tears were aligned and patched using Kizukishi paper and wheat starch paste. Losses on several sheets were pulp-filled using paper pulp made from Arches, cover, ivory paper. Weaknesses were reinforced on the verso using Tengujo paper and wheat starch paste.

Overlaps on the "B" papers were realigned and pasted using dilute wheat starch paste. As was anticipated, releasing the ripples on several sheets made it necessary to adjust the overlaps between two sheets. The change was noted in the report and photographed but made no visible change in the Map.

Treatment of both "A" and "B" papers

The "A" and "B" papers were realigned and adhered using wheat starch paste at the overlaps.

An alkaline reserve of methoxy methyl carbonate, methyl alcohol and trichlorotrifluoroethane (Wei T'O #2) was tested on the media. It was then brushed on the verso with overlapping strokes depositing magnesium carbonate in the paper.

A 1% methyl cellulose was applied to the recto or verso surface silverfish damage using a fine brush.

The papers were lightly humidified using a fine spray of deionized water. They were covered with Polytrac, 1/2" wool felts, 1/2" plywood sheets and weights. Normal irregularities expected from 46 joined papers were retained along with many of the original irregularities found in the "B" papers which could not be diminished further.

Exhibition of Oversized Artwork

The treatment of the David Parker Shaker Map required 16 feet long tables and a special lightbox. The photography of the Map, both rolled and unrolled, required a large room with equipment adapted for oversized artwork. Even turning over the Map required planning.

Nowhere was the planning more crucial than in designing the exhibition. Haphazard exhibition of an oversized artwork can undermine any stabilizing done by the conservator not to mention damaging the artwork.

The David Parker Shaker Map was to be exhibited all Summer and every Summer in the upstairs of an original Shaker building where there were no environmental controls.

At this point it would be important to explain a characteristic of oversized artwork. Consider a 20" wide sheet of paper. It can easily expand by 1/8" on a hot, humid summer day. A 15 feet 10 inches long sheet of paper can expand more than 1" under the same conditions.

With that in mind, the exhibition alternatives in the original Shaker building were limited to two plans.

Exhibition Alternatives

1. Build a self-sufficient case — a micro-climate — with controlled temperature and relative humidity, light filters and ample depth to allow for any movement of the paper.
2. House the artwork in a simple, unsealed but protective case also with ample depth. Accept the mild New Hampshire summer environment, and move the artwork to an environmentally controlled building for the harsh winter months.

Even though the (1) alternative was prohibitive cost-wise, design specifications were written by the conservator and drawn up by an architect to be built at a later date. The (2) alternative necessitated a protective case be built by the museum. The base would be built by the conservator. The base of the case would be a solid base on which the Map would be attached. The back of the case would be a wall of the Shaker building. The Map and base would be carried out of the Shaker building by way of a wide stairway to an environmentally controlled storage area every Fall.

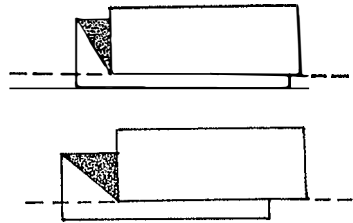
Support Panel(Base)

A solid support exhibition panel of aluminium Hexcel with aluminium skins was built in the customary manner and prepared for exhibition. It measured 41 1/2" x 16' x 3/4" (plus 1" for aluminium braces).

1. The surface of the aluminum Hexcel panel was cleaned with dilute, sudsy ammonia.
2. The 100% linen fabric was attached using Beva 371 adhesive on the vacuum hot table.
3. 4-ply, 100% rag content matboard cut to be 1/16" smaller than the map was attached to the linen fabric using Beva 371. The laminate structure was adhered while in a vacuum envelope on a hot table.
4. Square and angle aluminum reinforcing bars were screwed near the top and bottom edges on the reverse.
5. The Map was hinged to the matboard using Uda paper and wheat starch paste. Elvace 1874 was used to strengthen the paste attached to the matboard but not the paste attached to the map.

The square and angle aluminum reinforcing bars were attached to the back of the panel to facilitate its being connected to the wall in the Shaker building at a 30 degree angle which would greatly reduce the stress on the hinges and the map over time.

Expanding hinges were used on the sides and bottom edges to allow the map to expand and contract during the wide environmental changes to be experienced in the exhibition and the storage buildings during the course of a year.



8. Expanded Hinges

Transportation

A 22' long truck was necessary to properly transport the artwork completely horizontally to the Shaker Village. The ensemble of the panel and Map were wrapped in acid-free glassine, kraft paper and clean moving blankets. A wooden cradle lined with foam padding was constructed and attached to the floor of the truck to keep the Map in place during transit. The truck was completely empty except for the 16' x4' x 1" panel on the floor.

Conclusion

When working on oversized artwork, planning is essential. Objectives must be clearly delineated at the beginning of the planning.

Primarily, my objectives were to retain natural irregularities characteristic of such a composite work. Secondly, I hoped to draw the conditions of the "A" and "B" papers together — stabilizing the "A" papers and removing damaging materials from the "B" papers — so that they could age similarly together.

Last, I tried to provide the museum with a work of art in an exhibition package designed in such a way that it would be protected from new problems.