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Mary V. Hays
*Chinese And Japanese Textile Historians*

Ralph E. Hays
*Chinese And Japanese Textile Historians*

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A GLIMPSE OF JAPANESE DYEING WORKSHOPS

MARY V. HAYS and RALPH E. HAYS, Chinese and Japanese Textile Historians.

INTRODUCTION

While in Japan in September 1991 we were fortunate to be taken to several small dyeing establishments that make fukusa, furoshiki and kosode. We were most fortunate to have an entre into these establishments because without the proper introduction we would never have been able to make the contacts necessary for an invitation to observe their operation. We were fortunate also in being able to attend a special exhibition of kimono produced by contemporary textile artists. We could not help but be impressed by the cost of these kimono, which are one of a kind works of art. Those in the field are aware how labor intensive the various dyeing techniques are and how protective the individual artisan can be of the various specialized steps necessary in creating the finished product. The very high prices of these new kimono are brought into perspective when the time and effort to produce them is seen first hand!

We were quite surprised by the number of small family-owned workshops that are still in existence in Kyoto, processing and dyeing silk fabric. Many of these establishments have been in the same family for several generations and earlier generations may have produced some of the eighteenth century fukusa and kosode that we saw in the various exhibitions of Edo period textiles we attended last autumn. Except for the use of modern commercial equipment to steam the fabric, to regulate water temperature and provide proper ventilation, the textiles are embellished by using the same labor intensive techniques as those employed by the previous generations of textile artists.

The Japanese practice of not using plurals will be followed in this lecture. That is, when Japanese words, such as furoshiki, fukusa, kosode are used as plurals, no "s" will be added.

We will cover the four workshops we visited. The first workshop removed the sericin from the silk fabric. The second workshop printed the textile using a separate screen for each color. This process is a variation of the silk-screening technique used in Western printing. The third workshop dyed the textiles with a paste resist applied by using a stencils and the last workshop dyed the textiles using shibori techniques.

I. DEGUMMING PROCESS

The first establishment we visited removed the sericin from the woven silk. The sericin, the substance that holds the filaments together in the cocoon, is softened in boiling water before the filaments are reeled into thread. Most fabrics are woven with some sericin left in the thread. The remaining sericin must be removed from the fabric if it is to take the dye evenly. This process is called degumming.

The workshop was in the process of degumming crepe, chirimen, which
was to be used for making furoshiki, the wrapping cloth and han eri, the collar used on an under garment to protect a kimono at the neckline. The woven chirimen and habutae arrives at the workshop in bolts. Some of the fabric was white and some was blue. This is to identify one weave from another and the blue will wash out in the degumming process. The skeins of silk are dyed the identifying color before being woven into cloth. In this case the blue was habutae, a densely packed plain weave, and the white undyed silk was chirimen.

The bolts of fabric are first cut into a predetermined length for the degumming bath. The fabric for the furoshiki is about 27 inches by 13 yards and for the han eri, 12 inches by 13 yards. Next, loops of heavy thread were sewn through one of the selvage edges. These loops will support the fabric when it is dipped into the bath. A heavy cord was then run through the loops of heavy thread and tied. This cord is suspended from bamboo strips to support the fabric in the bath. The lengths of fabric are now ready for the bath. The bath consists of water heated from 194 to 212 degrees Fahrenheit to which a degumming agent is added. This consists of pure soap which has been shredded and mixed with a small amount of lime and a concentrated soda compound. Sometime hydrosulfite, a bleaching agent, is added. This mixture is added to the water.

The fabric is suspended in the bath from slats of bamboo which have been threaded through the cords. The fabric soaks in the bath for five hours. When removed, it is washed in clear water. It is again soaked in the bath for another four hours, at 194 degrees. This completely softens the sericin. After it is removed from the second bath it is again washed in clear water to remove any remaining sericin. It will then be dried.

After drying, the fabric will have changed its bulk. Six and one half pounds of the fabric weighs about five pounds after the sericin has been removed. The chirimen and habutae are now about two-thirds their original width. The fabric will now be sent to another workshop to be stretched to the desired width and finished for the actual furoshiki and han eri.

II. SCREENED PRINTING.

The first dyeing process we saw used a technique similar to silk screening. This workshop was making furoshiki, wrapping cloths. These furoshiki were for wrapping and carrying everyday items and therefore, they would be printed only on one side. If they were furoshiki for wrapping gifts in the formal gift giving presentation, they would be dyed on both sides and a process other than printing would be used.

We first saw the artist's drawing for a furoshiki that was just going into production. A second drawing of the same furoshiki was used to determine the colors, the number of screens required and the order in which the colors would be applied. In the right hand margin of this drawing were painted the colors that were required, the lightest color was first and the darkest color last. The chemist was in the process of mixing the colors to match those of the artist. A starch was added
to the dye to make it the consistency of a paste since a squeegee is used to apply the dye. Each color test was placed on a piece of fabric and these swatches were then placed in the order they will be applied to the fabric. After the colors are matched and the screens, which function as stencils are prepared, the furoshiki will be produced.

We next moved into the area where they were actually doing the screening. Of course, another design was being printed. This order was being produced for a large insurance company. This work area had long work tables, sloped at the proper angle. They were covered with white crepe, chirimen, of the proper width for the finished furoshiki. The horizontal edge was the selvage edge of the fabric. Before the screening began, the fabric was brushed with a white soybean extract, called goziru. It is a soybean paste thinned with water to a milk-like consistency. This extract prevents the dyes from running and gives a luster to the fabric. The dye is applied before the soybean extract dries completely. This causes a capillary action that creates even dyeing.

Along the lower edge of the sloped area that holds the fabric are metal stops. The worker brings the frame of the screen with the stencil against these stops before lowering it onto the fabric and applying the proper colored paste-like dye with a squeegee. A different screen is used for each color in the design. About seventeen screens, each with a different stencil, were required for this furoshiki. One screen was used twice to place one color over another. The whole work room was well ventilated with a series of fans that hastened the drying of each application of the dyes. The last screen that was used protected the area of the design of three mirrors, a cord and a tassel so that a pale yellow background could be applied.

When the printing of all the colors was completed, the continuous length of fabric on each sloped work area is raised. Tenters, shinshi, were placed on the cloth to keep it taut until it was thoroughly dried. When dried, the fabric was taken to the next area of the workshop where the dyes would be set by steaming.

Another furoshiki order was being prepared for steaming. The concrete floor was first covered with dry sawdust by using a coarse sieve. Part of the length of fabric was then laid on the dry sawdust. This was then covered with damp sawdust and the remaining fabric was folded back and forth with each layer sprinkled with damp sawdust. The sawdust protects the fabric so that the dyes on one layer will not rub against the dyes on another layer.

The fabric is then hung on nails in a rack with the protecting sawdust still adhering to the cloth. The rack holding the fabric is then slid into the steam box to set the dye. It remains in the steam box for forty minutes at 203 degrees Fahrenheit. Both silk and rayon are kept at 203 degrees for forty minutes. Polyester fabric is kept in the steam box for thirty minutes at 266 degrees. After the rack is removed from the steam box and the fabric cools, each length of fabric is taken from the rack and placed in a paper container the width of the
fabric. The container resembled a large rectangular basket. The fabric still had much of the sawdust adhering to it. These paper containers are then taken to another workshop where the fabric will be washed and finished. There it is pressed by stretching, cut into the prescribed length and the cut edges hemmed. The furoshiki are then ready to be marketed.

III. PASTE-RESIST DYEING.

The next establishment we visited made furoshiki and fukusa. The furoshiki were made out of hakusan tsumugi and chirimen. Hakusan tsumugi is a lusterless plain weave silk fabric woven with previously degummed spun thread of varying thickness, it is also called pongee. It is dyed after weaving. Chirimen is crepe. The fukusa, ornamental gift covers, were of shioze, also called shioze habutae, a warp-faced plain weave fabric woven with thick wefts in which both warps and wefts are unglossed, that is the sericin has not been removed. The fabric is degummed after it has been woven and before the dye is brushed on.

These furoshiki are for formal use with the fukusa when giving a gift and both the furoshiki and fukusa are finished on both sides by being brushed with dyes. The patterning is done on both sides by resisting the area to be patterned by using stencils or applying the resist paste freehand so that these areas are protected from the dye. After the area to be patterned is resisted, the dye is brushed over the entire fabric on both sides. When the resist is washed out of the fabric the patterned area is white.

The first step in this process is the cutting of the cloth to the proper length for the furoshiki or fukusa. The width of the fabric is predetermined and the two selvage edges are not hemmed on the finished furoshiki. The outline for the patterning is traced on the fabric through a stencil using a blue extract, aobana. This washes out in the final step of the dyeing process.

The stencils for the names of the regular customers ordering furoshiki and fukusa were kept in a rack. The stencils for both the name and family crest are made of paper mulberry fiber impregnated with fermented persimmon juice and then smoked to stiffen the stencil. When the order is for a man's use, the family crest and his family name is used. For a woman, her husband's family crest and her maiden name is used.

The resist paste is applied through a stencil for the family crest before the name is added to the fabric. First, one side would be stenciled, sprinkled with sand or sawdust so that the paste resist would not smear. The fabric is then turned over and placed on an opaque surface with a light underneath. The resist paste is then applied with the same stencil also turned over. This would then be sprinkled with sand. The light assists in the placement of the stencil since the crest on one side must exactly match the design on the other side. After the paste resist for the family crest has been applied to each side and it has been sprinkled with sand, order tags are placed on each piece of fabric and a tenter is put in place to keep the fabric
taut until the family name can be placed on the fabric.

In paste resisting the name, the starch resist is applied with a cone. This process is called *tsutsugaki*. In the past all the patterning, that is, both the name and any other patterning was done by *tsutsugaki*. Today only the name is applied in this manner because *tsutsugaki* is so time consuming and requires great skill. The starch used for the resist paste for *tsutsugaki* is made of glutinous rice, a small amount of slaked lime and a gum resin. This resist paste is put in a cone made of *washi*, paper, which has been stiffened with persimmon juice and there is a small hollow metal point through which the paste is squeezed. The left hand holds the tenter and the right hand squeezes the cone. As in the case of the family crest, the paste for the name is applied to both sides of the fabric. The name is first outlined with the resist paste and it is then filled in with the paste. It is then dusted with fine sand to protect the rest of the cloth and laid aside until the name is placed on the other side.

The name was placed on the other side of the fabric by another person. There was a light bulb under the fabric so that the name on the other side could be matched exactly. Again, sand was sprinkled on the resist paste so that it would not run or smear.

We next moved to the area of the workshop where the *furoshiki* and *fukusa* with the crests and family names in resist paste were being prepared to be brushed with the dye. Narrow strips of cloth were sewn between each *furoshiki* and *fukusa* and these were then grouped in a predetermined length about twelve or fourteen feet long and suspended between poles. Each length was made taut with tenters. The individual order tags were still attached to each piece of fabric. A worker was brushing a white soybean extract on the lengths of fabric. This prevents the dye from running and gives a luster to the fabric. After the soybean extract is applied the length of fabric is raised to get it out of the way while it dries sufficiently to be brush dyed.

Another worker was brushing the dye onto the fabric. Since each *furoshiki* and *fukusa* could be of a different color, the strips or bands connecting each piece of fabric is used to separate the different colored dyes. The color is brushed over the resisted family crests and the names. When all the colors have been applied to one side, the length of fabric is turned over and the dyes are brushed on the other side. Again, the dye covers the paste resisted areas. Suspended above the person painting on the dyes were *furoshiki* and *fukusa* which had been brushed with the soybean extract. They were drying to the point at which they will be lowered and brushed with the dye.

After the fabric was dyed, it was steamed to set the dye. The lengths of fabric are hung on nails in a frame that goes into a steam box. It should be noted that, unlike the screen printed *furoshiki* discussed earlier, no sawdust is necessary to protect the dye. This silk material remains in the steam box at 203 degrees Fahrenheit for forty minutes. A gas boiler is used in this plant to heat the steam.
After the frame is removed from the steam box, the fabric is washed in clear running water to remove the resist paste. Care is taken to assure that all of the paste resist is washed off the fabric. When the paste resist has been removed the fabric is soaked in a fixative to prevent the color from running. The fabric is then dried and sent to another area where each furoshiki and fukusa is separated, steamed to smooth them and the raw edges straightened. The selvage is not touched.

The raw edges are hemmed on furoshiki, which are unlined and dyed on both sides. The fukusa are also dyed on both sides but they are designed to be folded in half and sewn on three sides. This is called the hikikaeshi, doubled-back style of lining. A tassel is sewn on each corner. Each cloth is then checked before it is ready for the market.

IV. SHIBORI

The last establishment we visited patterned textiles using shibori techniques. Usually when the word shibori is used one immediately thinks of tie-dyeing as the manner in which the fabric is patterned. However, the verb shibaru can mean to bind, tie, fasten, truss, lash and brace. Shibori uses many techniques to resist the dye. No matter what method is used to pattern a textile with a shibori technique, the first step is to stencil the desired pattern on the fabric. We were shown a stencil that had the pattern punched out and it was ready to be placed on a piece of fabric to mark the desired patterning with a blue extract of aobana, which washes out in the dyeing process.

We were shown a length of fabric with the areas that are to be resisted tied with thread. This fabric with a simple design was stenciled in Kyoto and then it was sent to either China or Korea to be tied. If the fabric has more intricate patterning, the more complex designs are tied in Japan and then it is sent abroad to have the areas requiring simpler tying done there. A fabric that is patterned only with a design that requires very intricate work is done completely in Japan. The completed tied and dyed lengths of fabric appear quite narrow but they are the actual width of the fabric used to make a kimono. When the restraining threads are removed, the fabric is stretched to the full kimono width. This was demonstrated to us by showing us a piece of fabric that had been tied with threads in an allover pattern. By pulling each selvage edge outward, the continuous tying threads were released. The tying threads were of cotton. When the threads were released the fabric was more than once again the width it was when tied. This piece of fabric was now ready to be steamed to set the dye. Then it would be stretched to the proper width, sewn into a kimono and finished for the market.

We were shown next a piece of fabric that had been resisted by first wrapping the smaller patterned areas with thread. Then the larger areas to be resisted were first wrapped with thread and then covered with bamboo husks which were in turn tied to hold the husks in place. Both wrapping and tying techniques resist the dye when the fabric is dipped in the dye bath. Sometimes vinyl rather than bamboo husks is used as the resist.
Another piece of fabric had been dyed after the pattern had been resisted by another tying and wrapping technique. The small white spots were tie-dyed and the curved colored areas were done by using a wrapping technique called oboshi. Oboshi shibori uses a large disc. If a small disc is used it is called koboshi. The discs are plastic and are about half an inch thick and range in diameter from about four inches to an inch. There is a raised lip on the top and bottom of the side of the disc. The disc is covered with paper, which is replaced after each dyeing.

The design that is to be dyed is first outlined in small stitches. This stitched outline is placed around the side of the disc and the thread is then pulled tight around the side of the disc and secured. The area of the fabric to be dyed having been carefully gathered around the side of the disc, it is then secured by tightly wrapping string around the side of the disc. One end of the string is secured to a stationary point and the wrapped string is then carefully tightened around the disc by slowly revolving the disc. When tightened, the ends of the string are tied and knotted. The lip keeps the string from sliding off the side of the disc during the dyeing. There are many ways to use the oboshi. We understand that an expert can gather the fabric around the oboshi with the fingers and then secure it by wrapping the thread around the side. When several colors are used in the patterning, the lightest color is dyed first then the next darkest and so on.

Another method of shibori used in this workshop is called okezome, barrel dyeing. The portion of the fabric that is to be resisted is placed inside a barrel and the portion to be dyed remains outside of the barrel at either one or both ends of the barrel. The two lids are placed on the barrel, secured tightly with rope and the barrel is placed in the dye bath where it floats freely. The material remaining outside the barrel is held in place by a light rope. When the barrel is removed from the bath a heavier rope, which holds the two lids firmly in place is removed. This heavier rope has been tightly twisted and held in place by a peg which is removed with a mallet. When the lid was removed from one end of the barrel, the resisted fabric was visible. This fabric which had been dyed a lighter shade, had tie-dyed areas tied with pale blue thread. One area within the barrel had been resisted with bamboo husks. After some of the fabric was loosened from the sealed edge and pulled from inside the barrel the tie-dyed thread in both the light and dark blue areas and the curve between the light and dark blue fabric were easily seen.

When another barrel which had been in a red dye bath was removed and opened, it was possible to see the other end of the barrel with its paper seal and more tie-dyed fabric on the inside. Some of the fabric hanging outside the barrel had been tied with continuous thread and this gave the appearance of having been dyed with a lighter shade of red.

Another shibori technique which was done in this workshop. In this technique the length of fabric is first tightly rolled, then wrapped
with thread in the desired manner to resist the dye, then dyed. As the coil which resembles a rope, was opened the predetermined pattern was revealed. The length of fabric will be stretched to the proper size and finished for the market.

We were shown a kimono that was a very difficult and time consuming work of art. It had taken a year to produce and all of the work was done in this workshop. Threads, bamboo husks and discs were used to create the patterning. It was a tour de force of white, black and red with many resisted triangular areas. It is very difficult to use the discs for dyeing triangular areas because it takes great skill to make the last corner or point to meet or match properly. This kimono had white-spot patterning within both the red and black areas. First the areas of the white fabric that were to be dyed red were resisted to create the white-spot patterning. This was done by wrapping these areas with thread. Then those areas to be dyed black later were gathered around discs and tied so that they will not take the red dye. Then the entire piece of fabric was immersed in the red dye bath. Some artisans do not use the disc at this stage but dye the entire fabric red with only the thread-wrapped areas, which will create the white- spotted designs, resisting the red dye. Then the red dye is discharged from the areas to be dyed black. In the discharging process, discs are used to gather together the areas to remain red and protect them from the discharging agent and later the black dye. The areas from which the dye has been discharged are now white. Now the white-spotted patterning designed for the black areas is created by wrapping these areas with thread and the fabric is immersed in a black dye bath. All of these techniques are labor intensive. The many hours of hand labor is the reason why such a garment is so very costly.