

TIED AND DYED WORK

TIED AND DYED WORK: AN ORIENTAL PROCESS WITH AMERICAN VARIATIONS: BY PROFESSOR C. E. PELLEW OF COLUMBIA UNIVERSITY

IT has been suggested that some of the readers of *THE CRAFTSMAN* might be interested in a short description of a very ancient and exceedingly simple dyeing process, which, if carried out with modern dyestuffs, can be made to give extremely interesting and, indeed, beautiful results with a minimum of trouble and expense.

My own introduction to it was curious. A friend, with whom I had been discussing the subject of Batik, knowing how keenly I was looking for some good specimens of the same, telephoned me one day that she had noticed a great quantity of beautiful specimens in the Oriental department of a large and not particularly artistic department store. After much trouble, I identified the place, and found a number of beautiful Oriental textiles, of light muslin, with lovely bright coloring and very curious and intricate patterns, but evidently with no possible resemblance to Batik or Wax Resist work. I bought one

or two, at very reasonable prices, and studied them with great care to see how they could have been produced. Failing completely to solve the problem, I took one to a friend who, besides being an excellent dyeing chemist, has traveled through the East studying the textile work; after careful examination, he identified it as Tied Work or Tied and Dyed Work.

A little hunting through some of the Eastern art stores soon brought to light several other specimens of this work; one, a particularly elaborate and beautiful one, a small portion of which is shown in Fig. 1 being just as it came from the dye bath with the knots still untied; and other fine pieces were found in the collections at the Teachers' College.

A few weeks later, one of the instructors at the Teachers' College, New York, brought over to me a piece of calico, curiously tied and twisted, and asked if she could dye it with a good fast color, stating

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that it was a piece of Tied Work. The results were satisfactory, and we repeated the experiment at a public lecture on the Sulphur Colors, where the cloth was tied up by my friend, dipped into a deep blue bath, wrung out, exposed to the air, and then, before the end of the lecture, was untied and shown to the audience. Several of my students then became interested, and began making some experiments, until it became evident to us all that, thanks to modern dyestuffs, this simple old process could be made to yield extraordinarily useful, as well as beautiful results.

I have not had a chance to study carefully the literature on the subject. But in the *Journal of Indian Art*, volumes I, II, will be found two short articles, with good illustrations, on the East Indian process; and in a recent number of *Harper's Bazar* appeared a very carefully written paper on the subject, under the rather extraordinary title of "Gobolink Tapestry." This article gave many interesting details about the technique, with illustrations, and showed several excellent designs, but I should doubt if the results achieved with the dyes there mentioned, the Salt Colors sold in packages at the druggists', would be fast either to light or to washing.

The Process in General.—As has been previously mentioned, there are three general methods known, it is believed, from the time of the ancient Egyptians for obtaining patterns of dyes upon plain cloth. One way is by direct applications, free-hand or stencil, of the dyestuff to light-colored cloth; painting the cloth, in other words, with the dyestuff.

A second way is by "discharge," i. e., by dyeing the cloth first, and then applying some agent which will bleach or discharge the color in parts.

The third way is the "resist" method, by which some agent, mechanical, or it may be chemical, is applied to parts of the cloth before dyeing, which protects those parts from the action of the dyes, and leaves the pattern light-colored against a dark background. The Wax Resist or

Batik process belongs to this class, as also does the process of Resist Stenciling, previously described. In some cases patterns are produced by protecting parts of the cloth from the action of the dyestuffs by metal or wooden plates or blocks sewed tightly on both sides, or by other crude devices. But a still simpler method is to protect certain limited portions of the cloth from the dyestuff by tying them tightly with thread or string, or, for large surfaces, with tape, which, when wrapped round and round any particular part of the fabric will enable it to stand very considerable exposure to the dye bath without absorbing much, if any, of the coloring matter.

Indian Practice.—In Hindustan and particularly in the district of Rajputana, this process has been practiced for centuries and brought to a great degree of perfection. The finest products come from the state of Kotah, and under the name of Chunaris are used for turbans and for various articles of men's and women's clothing. Two general varieties are known there; the fast or Pacha Chunar, which are made on heavy, cheap calico in simple designs, and are dyed with indigo, turmeric and sooranjee or morinda, thus giving comparatively fast designs in blue, yellow and red respectively, and the more expensive and elaborate goods, known as Kacha Chunar, which are made on fine muslin, with colors much less fast to water, but with much more intricate and elaborate designs. Usually the patterns are marked off on the cloth with red chalk before tying, and the light shades—yellow and green—are produced by dipping the particular parts of the cloth into a bath of turmeric, and of turmeric and of indigo, respectively. The pattern is then tied in by means of an immense quantity of small knots made with fine thread, and giving when untied light-colored circles and rings varying in diameter from half an inch or less to not more than one inch. The work people are exceedingly skilful in this work, tying extremely fast and very tightly

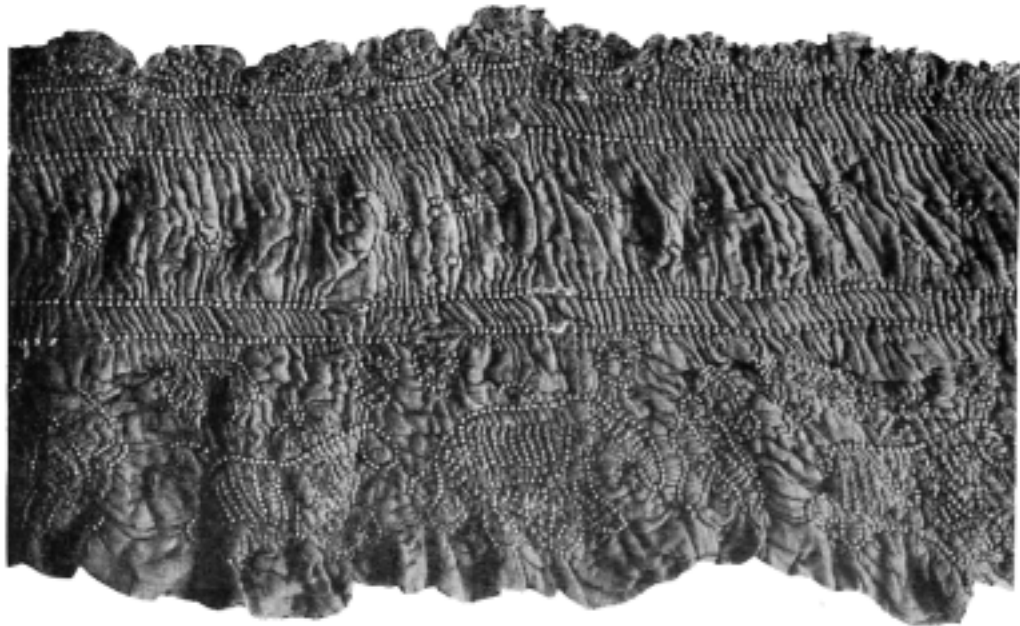


FIG. ONE: A PIECE OF ORIENTAL DYED WORK JUST AS IT CAME FROM THE BATH, WITH THE KNOTS STILL UNTIED.
THE SAME PIECE OF DYED WORK WITH THE KNOTS UNTIED AND THE CLOTH SHAKEN OUT SO THAT THE DESIGN SHOWS.



FIG. TWO: DYED WORK IN WHICH THERE ARE ONLY TWO COLORS, THE LIGHT PATTERN ON THE DARK GROUND.



FIG. THREE: BANDED EFFECT IN DYED WORK, PRODUCED BY LOOPING THE CLOTH.

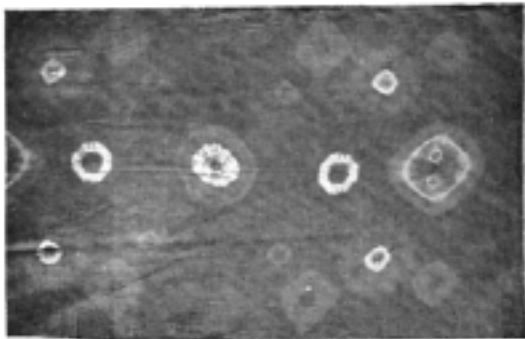


FIG. FIVE: FOUR-COLOR DESIGN FOR TIED WORK, TO BE USED TO DECORATE A SILK SCARF.



FIG. FOUR: DYED AND DISCHARGED WORK: BLUE AND GRAY PATTERN ON A WHITE GROUND.

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around little loops of the cloth pushed out into a pointed form for the occasion. The knot is not tied all the way out to the point, but only around the base, so that the tip of the tied portion of cloth is exposed to the dyestuff when the final dyeing takes place, and thus gives the effect of rings or circles or diamonds of light color, with dark centers.

The final dye bath is of safflower, which gives a bright red, or when less concentrated, a brilliant pink. But neither this dye nor the turmeric is really fast to light, or when thus dyed, to severe washing. The turmeric, indeed, contained in the yellow and the green portions of the pattern, is not much more than a stain, because after tying, and before dyeing in the final bath of red, it is customary to wash off the color from the stained portions not absolutely covered by the string of the knot, thereby preventing overlapping of shades when the red dye is applied later.

It is evident that in this process the dyeing is a matter of very little trouble compared to the tying of the design. In some specimens which I have examined and which are sold in New York for quite small sums apiece, the cloth is some four yards long and has an average of over twenty-five of these small knots to the running inch. So that, even with the skilful fingers and the low wages of the Eastern workmen, it is not surprising that the tying alone of one of these Chunaris would occupy a first-class workman for some three weeks, and represents some two-thirds of the total expense of the process.

To diminish this labor somewhat in some specimens it will be noticed that the patterns have been stamped or pressed out in the cloth mechanically by some sort of a simple machine, thereby greatly lessening, not the number of knots, but the speed and accuracy with which the design may be reproduced. In those that I have examined the cloth was first of all, doubled lengthwise, and then folded into four folds of about a yard each. The

pattern was evidently pressed, after staining the yellow and green design, in some sort of a huge, exaggerated waffle-iron, a kind of a folding board, with nails or spikes or projections of some sort on, say, the lower board, and with corresponding depressions in the upper one. Thus when the cloth, folded as described and previously stained, was placed in between these and pressed tightly, the light muslin would be pressed out into the desired patterns, and a tyer could then come along and tie the raised or pulled-out portions into knots at his leisure.

Modern Practice.—Much work has been done in America, and I believe also in Europe, by craftsmen upon this ancient and simple process. It is evident at the start that to make patterns with such an expenditure of time and labor is absolutely out of the question, accordingly the instant modification suggested itself of tying the knot to envelop large portions of the cloth at a time, so that instead of the diameter of the tied part being half an inch to an inch, one knot, after dyeing and untying, would cover a surface of anywhere from three to four inches up to six inches or a foot or more. When tied on a large scale in this way it was speedily found that the beauty of the pattern lay very much in the strange and interesting and quite unexpected irregularities in color and shading caused by the uneven penetration of the dyestuff into and under the string or tape employed to cover these large surfaces. Regularity of design can be easily obtained by using material of a more or less porous nature and folding it into four squares, and tying all four folds together in knots of varying sizes. When dipped in the dye-pot and then untied these light spots will be regularly reproduced in all four quarters of the material, and if carefully placed will give very pretty and effective designs with a minimum of labor.

The Use of Modern Dyestuffs.—The introduction of the dyestuffs which give fast colors upon cotton without mordanting, more particularly the Sulphur Dyes

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and the Indigo or Vat Dyes, have converted this simple process from a curious and interesting pastime, into an extremely useful and valuable textile process for handicraft workers. Simple, two-color effects can be made, with a minimum of time and trouble, so as to cover large surfaces of textile materials with interesting and even beautiful designs, which are absolutely fast to washing and to light. It is indeed doubtful whether we have any process at our disposal that compares with this in simplicity and economy, as well as in beauty, for many classes of work such as curtains, portières, table covers, sofa cushions, veils and scarfs. In other words, where the effect is produced by variations in color upon a single textile fabric, the materials used for this purpose should be soft and more or less porous, and to give good results should be very carefully cleaned, not only from dirt and grease, but from different varieties of sizing and finishing materials. Excellent results have been obtained with different varieties of mercerized cotton, of muslin, scrim, and even of the cheapest varieties of ordinary cheesecloth; while those of my readers who are less thoughtful of expense will find much interest in making scarfs and covers from different varieties of silk and poplin.

It is difficult in an article like this to begin to give an adequate idea of the technique of the process. An hour's work with a few yards of cheesecloth, tying it in knots and loops of different sizes, and then noting the effect from immersing it in the dye bath would be of more assistance than any words of mine. But it may be pointed out that, where the desired effect is that of a ring, large or small, surrounding a dark circle or diamond shaped figure, it is best to first place in the center of the design a solid object such as a marble or bead or even a stone more or less symmetrical, and loop the cloth over this, tying the knot more or less tightly and of greater or less dimensions, underneath the solid object. The marble or stone spreads out the cloth, thereby exposing it fully to

the action of the dyestuff, and thus emphasizing the contrast with the tied portions which are partially protected.

On the other hand, if it is desired to have a pattern with a radiating motif, as for instance, in the pretty design shown in Fig. II, where the effect of the central figure is somewhat that of a sunburst with rays pointing toward the center, the solid object in the center is usually left out, or kept very small. The cloth, however, is tied up in folds running toward the center and the knots are not drawn so tightly as to prevent some of the dyestuff working its way through these folds, and thus giving the radiating lines desired.

The craftsman with any ingenuity can easily work out all kinds of new and original effects by simply modifying the method and direction in which the knot is tied. For instance, curiously banded effects can be produced (see Fig. III) by simply taking a piece of cloth and tying loops directly across it, or borders can be made by looping with thread or with tape, and, preferably, a darning needle, strips of cloth around the edges of the design. Indeed one charm about this process is that everyone who works at it at all intelligently will have the pleasure of discovering for himself new methods of getting new effects—a pleasure which is not necessarily interfered with by the knowledge that probably the ancient Hindus discovered the same thing hundreds, if not thousands, of years ago.

We had the pleasure in our laboratory this spring of discovering one new method which gave interesting results, and which, so far as we could gather, had not been worked out by the ancient Hindus or by anybody else. This very simple modification gives results the exact reverse of the ordinary ones and might be described as Tied and Discharged Work instead of Tied and Dyed Work. In other words, wishing to break away from the monotony of always having light patterns on a dark background, we one day tried the effect of dyeing a piece of cheesecloth dark blue, with a Sulphur Color, and then immersing

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it in a weak bath of bleaching powder. Naturally, the color disappeared in the exposed portions, and then, on washing with a little weak acid and rinsing with water, on untying, the pattern came out dark on a white background (see Fig. IV).

Very curious and unexpected results appeared when we tried this process upon the different dyestuffs, and I am sorry to say we have not had time to begin to cover the infinite possibilities presented by this single modification. We noticed, for instance, that the Sulphur Colors, with which we experimented, bleached quite readily, and in some cases, as for instance, with Thiogene Blue B, the finished pattern appeared in interesting shades varying from deep blue to a light gray, according to the degree with which the tying had resisted the action of the bleaching powder.

On the other hand, when we tried the various Indigo or Vat Colors we found that they resisted the action of bleaching powder to a very considerable extent, changing color, indeed, but not becoming white, as with the Sulphur Dyes. Pure indigo, for instance, turns a shade of green, while, when experimenting with a new Vat compound, Brom Indigo R (Elberfeld), to our great surprise we found that the chlorine of this bleaching powder converted the deep, purplish blue into a brilliant and very permanent shade of yellow.

If any of my readers are interested in trying for new and unknown effects, there is a considerable field open to them in this process. Care, however, should be taken in this Tied and Discharged Work to start off with a strong material like scrim or poplin, rather than light and cheap qualities of cheesecloth, because the bleaching powder, even in the form of a weak solution of one or two tablespoonfuls to the gallon, is liable to have quite a weakening effect upon the fiber.

Three and More Color Effects.—The patterns hitherto described have all been based upon two colors, the simplest being, of course, the blues or black or grays upon

a white background. In case, however, the fabric is dyed a light yellow shade before it is tied in, and then dipped in some other color, as, for instance, a light blue, the result will be a yellow pattern on a green background. It is extremely easy to continue this process of tying and dyeing until the pattern is composed not only of two or three, but of five or six colors, each darker shade being built upon the shades previously imparted to the cloth. For instance, one of our illustrations shows a silk scarf dyed in four colors (Fig. V). The silk was first dyed yellow, with fast Sulphur Yellow O. O. Metz, and after folding the yellow spots were tied in. It was then, without untying anything, dipped in bath of Thiogene Rubine, O. Metz, which turned the background a pretty shade of salmon red. Various knots were tied in this color, and the cloth dipped in a weak bath of blue, Thiogene Cyanine O, which on top of the salmon red gave a pretty shade of light olive green. Parts of this were then tied in and the piece placed in a final bath of strong blue dye, which brought the background to a full deep olive green color. After this the piece was untied, and, as was natural, the coloring was most harmonious and pleasing, each shade being built up from the colors which preceded it.

In our laboratory we have found that this process, when used with the Sulphur Colors, gives the most satisfactory results for students and rather unskilled craftsmen of any that we have experimented with, while the possibilities of it in the hands of a well-trained dyer are very great. The Sulphur Dyes present the enormous advantage over the Salt Dyes, commonly sold in drug stores for the dyeing, or rather staining, of cotton and linen, of being extremely fast to washing and also to light, if properly selected. It is suggested to some of our readers that for summer curtains and portières to be made of cheap materials and simple colors, as well as for more ambitious products, this process will repay very careful and earnest experimenting.